Section A of Science Abstracts

SECTION A, PHYSICS: SECTION B, ELECTRICAL ENGINEERING

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Cumulative Subject Index

1955-1959

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FOREWORD

The Cumulative Subject Index covering the years 1955-1959 has been prepared basically as an amalgamation of the five annual published indexes. The entries under each subject heading are arranged in alphabetical order of the first word, irrespective of the year of the entry. Where a new subject heading was introduced during the 5-year period this has been noted and the attention of the reader drawn to the appended "see also" headings under which the relevant earlier literature will be found.

The numbers after the entries are the serial numbers of the abstracts, and the respective years are indicated by the initial number giving the last digit of the year; thus "8=1234" means "Abstract 1234 of 1958".

D. S. Hopper
Director, Science Abstracts.

May 1967

SUBJECT INDEX

INTRODUCTION

The entries in this index refer to the abstracts by their serial number, not by the page number. The entries are grouped under headings (printed in bold type, e.g. "**Abrasion**") which represent, in the main, general categories or concepts rather than specific names. If a heading for a particular subject does not appear, a more general heading should be consulted; for example, "Zone plates" would be listed under "**Diffraction**"; "Barkhausen discontinuities" under "**Magnetization process**". There are numerous cross-references directing attention to related headings in other parts of the index.

Many of the headings are subdivided by the use of subheadings, which are indented (i.e. printed slightly to the right) and commence with a small latter (for example, see the subheadings under "**Absorption**").

ARRANGEMENT OF HEADINGS AND SUBHEADINGS

The headings are arranged throughout the index in alphabetical order according to British Standard 1749:1951 (the "word by word" system, not "reading right through"). The subheadings, with a few exceptions, are themselves arranged in alphabetical order under their respective headings. The exceptions (for example, see the subheadings under "**Spectra**", "**Crystal structure, atomic**") are cases where a more logical order is preferable to a purely alphabetical one.

ARRANGEMENTS OF ENTRIES UNDER HEADINGS

Entries are arranged in two alphabetical groups as follows. First group: generalities and named substances (in words); second group: named substances (chemical formulae). If a search is being made for a particular substance, both the first and second alphabetical groups should be inspected since, for example, alumina may also be listed as Al_2O_3.

COLLECTED LIST OF SUBJECT HEADINGS

The alphabetical arrangement of the headings is the most convenient for locating a known heading quickly, but there may be other related headings elsewhere in the index of which the reader is unaware, and which he would only come across by accident. To assist the reader to discover all the headings appropriate to his subject, a collected list of the headings is given on the following pages, which should be consulted as a matter of routine each time a search is made. In this list, the headings are not arranged in alphabetical order, but are grouped into sections by subject on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. By using this list, the reader can quickly determine which are the headings appropriate to his subject, and they are then easily found in the main index in their alphabetical position.

HEADINGS WITH NO ENTRIES

Because physics is a developing subject, it is not possible to maintain the list of headings unchanged from year to year; it is subject to a continuous process of revision, with the introduction of new headings and subheadings, and the alteration and elimination of old ones. This process is a gradual one, however, and the great majority of the headings used in any given year are the same as those of the previous year. The headings used in this cumulative index are those of the 1959 index, so that entries under headings of the years 1955-58 which were changed by 1959 now appear under the updated headings. Those headings and subheadings, for which there are no abstracts recorded in the present volume, are followed by the announcement "No entries", this supplies confirmation that these headings had not been dropped from the index, and entries might reappear under them in a later year.

ELEMENTS, COMPOUNDS AND OTHER SUBSTANCES

The names of elements, their compounds, a few compounds of special interest (e.g. "**Water**") and a few common materials (e.g. "**Wood**", "**Paper**") are included as headings. Under these, as well as under the appropriate "subject" headings, are listed any abstracts which contain significant physical information about the element, compound or substance named; except, however, that abstracts listed under headings referring to nuclear properties, including radioactivity, are not necessarily also listed under the substance name. The entries under these headings are themselves arranged in alphabetical order of substance or nuclide names, so that a given substance can be readily located.

Inorganic compounds of the elements are listed under the first element in the chemical formula, and all the compounds of a given element are grouped under a single heading (e.g. "**Sodium compounds**"). Alloys are listed under the first constituent, e.g. Cu-Ni alloys under "**Copper compounds**". Organic compounds are grouped under "**Organic compounds**", "**Polymers**", "**Plastics**" and under special substance headings such as "**Paper**", "**Proteins**", etc.; all the latter are listed in the collected list of headings on the following pages.

BEFORE USING INDEX, CONSULT LIST OF SUBJECT HEADINGS PRINTED ON THE FOLLOWING PAGES

LIST OF SUBJECT INDEX HEADINGS

The headings used in the Alphabetical Subject Index are listed below, grouped into sections by subject on the same basis as the arrangement of the abstracts in the monthly issues of Physics Abstracts. Many of the headings are listed in several places, so that each section lists all the headings which concern its subject. Those headings which it is desired to consult can be found in the main index in their respective alphabetical positions.

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- Isomerism

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- Bonds
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- Suspensions

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  - growth
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Seismology
Seismic waves
Seismographs
Terrestrial electricity
Terrestrial magnetism
  variations
Compasses
Magnetic storms

Earth
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  composition
  heat
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Radioactive dating
Geophysical prospecting
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Tides
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Hygrometers
Anemometers
Atmospheric pressure
Humidity
Atmosphere
  composition
  humidity
  movements
  radioactivity
  structure
  temperature
  thermodynamics

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Ionization, atmosphere
Atmospheric disturbances
Thunderstorms
Magnetic storms

Sunlight
Sky brightness
Wind
Clouds
Snow
Ice
Rain
Fog
Condensation
Evaporation
Climatology

Atmospheric optics
Atmospheric spectra
Visibility
Airglow
Twilight
Zodiacal light
Atmospheric electricity
Atmospherics
Aurora
Lightning
Atmospheric acoustics

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PHYSIOLOGICAL PHYSICS

Biology
Biophysics
Biological technique and instruments
Physiology

Vision
Colour vision
Eye
Stereoscopy
Ear
Speech
Hearing
Hearing aids
Noise

Zoology
Medical science
Proteins
Blood
Bone

Biological effect of radiations
  acoustic waves
  ionizing radiations
Radiography
Hygiene
Radiation protection
Dosimetry

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Low-temperature technique
Vacuum technique

Biological technique
Chemical technology
Metallurgy
Zone melting

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  colour
  high-speed
  infrared
Lenses
  photographic
Cameras
Photographic light sources

Photographic materials
  sensitivity
Nuclear track emulsions
Photographic process
  development
Densiometry
Radiography
Cinematography
  high-speed

MATERIALS

Deuterium
Tritium
Air
Ozone
Liquid helium
Ice
Steam
Water
Seawater

Alloys
Metals
Semiconductors
Semiconducting materials
Steel
Fibres
Paper
Wood

Diamonds
Graphite

Glass
Glass-metal seals
Mica
Optical materials
Quartz
Rochelle salt

Bitumen
Ceramics
Coal
Concrete
Clay
Sand
Soil
Bone
Blood
Gelatin
Leather
Proteins
Rubber
Waxes
Plastics
Polymers

The chemical elements are listed by name, followed by their compounds. Organic compounds are grouped under the heading "Organic compounds". In addition, there are also the following special substance headings:

Alkali metals
Alkali metal compounds
Alkali earth metals
Alkali earth compounds

Alloys
Rare earth metals
Rare earth compounds
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- P^{28} 5=7320
- P^{29} mirror nucleus 5=2126
- P^{30} 6=2350
  - β^+, upper limit 5=9089
- P^{32} 6=3150; 7=2590, 8131; 9=1735, 3862, 5002, 6089, 11449, 12658
- Pa^{230} 6=616, 3148
- Pa^{233} 5=9862, 9=13637
- Pa^{234} (UX complex) 6=3153, 6114
- Pb^{200}, coincidence meas. 6=407
- Pb^{202m} 8=3317
- Pb^{206} 8=6268
- Pb^{208} (ThD) 8=7358
- Pb^{210} (RaD) 5=9036; 8=2544
  - Migdal' s theory verification 5=472
- Pb^{212} + Bi^{212} (ThB + ThC), Auger L-electrons 7=1368
  - precision meas. 6=3155
- Pb^{98,99,101}, positron 6=8942
- Pb^{109} 8=5302
- Pm^{147} 9=6089
- Po^{206}, conversion electrons 8=2529-30
- Po^{207} 9=6063
- Po^{214} 5=9058
- Pr$^{135-6}$ 5=1146
- Pr$^{136-9}$, rel. to K-capture 9=2723
- Pr^{137}, β^+ end-point 9=2722
- Pr^{142}, soft 2nd 5=8199
- Pr^{143} 9=5007, 6089
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- Pt^{196}, conversion electrons 9=641
- Pt^{197} 6=1537
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- Rb^{84} 6=617
- Rb^{86} 5=4010, 7325; 6=5357
  - inner group, statistical shape 9=5005
- Rb^{88} 5=3047
- Re$^{180-1}$, conversion electrons 9=2721
- Re^{182} 9=3852, 6078
- Re^{183}, conversion electrons 9=2721
- Re^{186} 6=2347, 8350
  - first-forbidden, non-unique 5=7326
- Re^{187} 9=1740, 4994
- Re^{188} 6=2347; 7=2587; 8=5312

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- Rh^{99} 6=2344, 8942
- Rh^{101} 6=8942
- Rh^{105} 6=5357
  - complex β^- 5=4892
- Rh$^{107-8}$, from γ-ray study 9=6100
- Rn^{220} (thoron), L-Auger lines 9=5000
  - Tn + Th eman. 7=9356
- Ru^{95} 6=7648
- Ru^{97} 6=5356
- Ru^{103} 5=2999, 3052, 6416, 5356; 8=1927
- Ru^{105} 6=5356
- Ru$^{107-8}$, from γ-ray study 9=6100
- S^{35} 5=484, 3069, 2590; 8=1930, 8294; 9=5003, 6089
- S^{38} 8=9025
- Sb^{116} 6=8353
- Sb^{117} 5=2125
- Sb^{122} 5=2116, 5607, 9858
- Sb^{124} 5=2115, 4029
- Sb^{127,129} 6=3947
- Sc^{40} 5=7320
- Sc^{42} 8=5294
- Sc^{46} 6=3151
- Sc^{47} 5=8193; 6=1527; 7=2573
- Sc^{48} 8=3329
- Sc^{49} 6=2351, 4604
- Se^{71}, e$^+$ emission 8=4287
- Se^{73}?, positron 6=8353
- Se^{83m} 9=6071
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- Sm^{151} 9=7325
- Sm^{153} 5=9041; 8=5276
  - conversion electrons 9=635
- Sn^{113} 9=7325
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- Tb$^{153-4}$, conversion electrons 9=12639
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- Tc^{98} 6=604
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- Te^{129m} 6=6113
- Te^{129} 6=609, 2338
- Te^{131} 5=4014
- Te^{133m}, β - branching ratio 8=6277
- Th^{233} 7=9855
- Th^{234} (UX) 6=3153, 6114
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- Tl^{195,197} 8=3356
- Tl^{198m} 8=7348
- Tl^{200} 7=9325
- Tl^{204} 5=4006, 9855; 9=11442
- Tl^{208} (ThC^{11}) 6=4609; 7=2612; 8=5309, 7359; 9=11457
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- U^{230}, decay series 7=1558
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    - $Ca(H_2PO_2)_2$, neutron diffraction exam. 7=9469
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    - pyrophosphates, different forms 5=3601 [5=3602
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    - $SrTiO_3$, rel. to method of prep. 7=4907
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    excited states   6=4615
  $C^{13}(p,\gamma)N^{14}$ 5=1180
  C^{14} 9=1752
  C^{15} 7=3587
  Ca^{40} 9=7308
  Ca^{47} 6=1535; 7=2573
  Ca^{48} 9=4973

Gamma-ray spectra - contd
  Ca^{49} 6=2351, 4604
  Cd^{104} 6=610
  Cd^{111} 9=7316
  Cd^{113} 7=2602
  Ce(n,γ) 9=10080
  Ce^{137,137m} 9=2723
  Ce^{140}, conversion spectra 9=10088
    excited states study 5=8152
  Ce^{141} 5=4028; 7=9354
  Ce^{143} 6=3142
  Ce^{144} 5=1163, 2146; 6=6111; 8=1920
  Cf^{246} 5=4904
  Cf^{250} 6=613
  Cf^{252} 6=613
    spontaneous fission 7=2600; 9=2844
  Cl^{32} 5=7320
  Cl^{35,37} 7=3611
  Cl^{39} 7=2572
  Cm$^{242-3}$ 7=2607
  Co, neutron capture 6=1536; 7=4678
  Co^{55} 9=2725
  Co^{56} 7=2603; 9=11435
  Co^{57} 5=4896, 4900, 8183, 9035; 7=6526; 9=8546
  Co^{57} → Fe^{57} 6=2377
  Co^{58} 5=8183; 6=5352; 7=2549, 2603; 8=3344
  Co^{59} 8=1981, 3352, 8316, 9062; 9=3919
  Co^{60} 5=2151; 6=1521; 9=5972, 8434
    in concrete, sec. radn. 5=3074
  Co^{61} 6=601
  Co^{62} 5=478; 7=9843
  Cr, neutron capture 6=1536
    neutron scattering 6=5394
  Cr^{48} 5=8188, 6=608
  Cr^{51} 5=4019; 6=3139; 7=9844; 9=6094
    internal bremsstrahlung 6=633
  Cs, α-bombarded 8=1969
  Cs^{126} 5=1206
  Cs^{131}, internal bremsstrahlung 6=3169
  Cs^{134} 5=1161; 6=3946; 9=13648
    due to neutron capture 9=2761
  Cs^{136} 9=10081
  Cs^{137} 9=5972, 8434
  Cs^{138} 5=3047
  Cu, + n 9=3919
    p bombarded 6=6127
  Cu^{59} 6=1517, 3962
  Cu^{62} 5=478; 7=9842; 9=2760
  Cu^{64} 9=10060
  Cu$^{65}(p,n\gamma)$Zn^{65} 9=2758
  Cu^{66} 9=608
  D(p) 5=9076
  Dy^{160} 8=5277; 9=8532
  Dy^{161} 8=8277
  Dy^{163} 8=3320
  Dy^{165} 6=7655
  E^{253,254m} 6=3934
  Er, neutron resonance capture 9=8632
  Er^{167} 9=6070
  Er^{171} 7=3581; 8=5307
  Eu$^{145-7}$ 9=10105
  Eu^{151} 8=2531
  Eu^{152} 6=7655; 7=8127; 8=1918, 2531, 4286, 5332, 6272; 9=7329,12666
  Eu^{152m} 7=8127; 9=1745
  Eu^{153} 6=5369
  Eu^{154} 6=7655; 8=319, 4286, 6272, 7337; 9=12666
  Eu^{155} 8=6224
  F^{19} 8=5325, 8314
  F^{19} (d) 5=514, 8217
  F^{19} + n 5=9928; 7=2532; 9=3919, 8633
  F^{19} + p 5=7364,; 6=2312, 3208; 9=2757
  F$^{19}(p,\alpha\gamma)$O^{16}, Doppler shifts 9=6062
  F$^{19}(p,\gamma)$Ne^{20} 9=7335
  F$^{19}(p,p^{1}\gamma)$ 9=2758
  Fe + n 5=522, 4916, 9102, 9930; 6=1536; 8=1266; 9=3919
  Fe$^{52-3}$ 9-4991
  Fe^{54} 8=764
  Fe^{55}, continuous (inner bremsstrahlung) 6=4613
  Fe^{56} 8=764
  Fe^{57} 8=305, 764, 2534
  Fe^{59} 9=13649
  Ga, Coulomb excitation 7=2531
  Ga^{65} 9=2727
  Ga^{68} 9=4998
  Ga^{70} 7=3596; 8=5325
  Ga^{72} 6=3141
  Ga^{73} 9=1729, 7321
  Gd 9=10105
  Gd^{A}, A = 144 or 145 9=12638
  Gd^{147,149} 8=5296
  Gd^{151} 8=2532, 2546
  Gd^{152} 9=11460
  Gd^{153} 6=8346
    internal conversion 6=6862
  Gd$^{154-6}$ 9=11460
  Gd^{159} →Tb^{159} 6=603; 9=1720
  Gd^{161} 9=12644
  Ge^{66}, α-bombarded 7=5601
  Ge^{67} 7=5601; 9=8528
  Ge^{68} 6=6110; 9=4998
  Ge^{70} 8=7388
  Ge^{71} 5=9886; 6=5365
  Ge^{72} 8=7388, 8302
  Ge^{73} 8=2537, 7388
  Ge$^{73}(p,p^{1}\alpha)$ 9=2758
  Ge^{74} 8=7388; 9=6073
  Ge^{75} 5=9001; 8=3333
  Ge^{75m,77,77m} 5=2119
  Ge^{76} 8=7388
  He^{3}, radiative d capture 5=1199
  Hf, neutron capture 8=5325; 9=8632
  Hf^{175} 5=9034
  Hf^{177} 7=9328
  Hg^{140} 9=13629
  Hg^{195,197} 6=602
  Hg^{198} 8=7348
  Hg^{199} 8=1981, 3352, 6280
  Hg^{200} 8=3354; 9=2755
  Hg^{203} 5=4894; 9=8434
  Ho^{160}, internal conversion 9=10062
  Ho^{164} 5=1149
  Ho^{165} 9=10078
  Ho^{166} 8=1233; 9=599, 3872
  Ho^{167} 5=6417
  I, neutron capture 6=1536; 7=4678; 9=10080
    neutron scattering 6=3158
  I$^{123-4}$ 9=4999
  I^{126} 5-7319
  I^{127} 8=2589, 3352
  I^{128} 6=1514, 1516, 3165; 8=7349; 9=1747
  I^{131} 9=5972
  I^{132} 5=2117
  I$^{133-4}$ 9=11440
  I^{136} 9=7315
  In^{114,114m} 6=4606
  In^{115}, from resonance neutron capture 9=2765
  In^{117} 5=2125
  Ir, neutron capture 9=10080
  Ir$^{185-190}$ 9-1728
  Ir^{188} 9=2708
  Ir^{191m} 5=475, 4005
  Ir^{192} 5=2122; 6=1519, 1524, 1540; 7=6516; 9=12666
  Ir^{192m} 5=480
  In^{194} 5=2122, 4901; 6=1540
  K^{39} 7=3611, 5621
  K^{40} 6=2339; 9=6076
  K^{43} 7=6519;9=12643
  Kr^{76,77,79,85m,85,87,88} 5=3047
  Kr^{85}, fission-product, assay 9-12668
  La^{134} 9=13648
  La^{135} 9=3847
  La^{138} 7=4669
  La^{140} 6=605; 9=10074, 11454
  La^{141} 9=12646
  La^{142} 8=6231; 9=12646
  Li^{6} 8=1912
    p bombarded 5=4037; 6=3201
  Li^{7} 5=2188; 8=5324
  Lu$^{170,172-4}$ 9=4992
  Lu^{175} 5=4913
  Lu^{176} 5=9854
  Lu^{177} 6=1540
  Lu^{178} 9=7334

Gamma-ray spectra - contd
Mg 5=6441; 8=5325
Mg$^{24-6}$(p,p$^1\gamma$) 9=13662
Mg^{24} 5=9002
Mg^{24}(p,γ)Al^{25} 6=3207, 3959; 7=702, 1596; 9=2779, 10110
Mg^{25} 5=3064; 9=13646
Mg^{25}(p,γ)Al^{26} 5=3091; 6=5384
Mg^{26}(p,γ)Al^{27} 7=8824
Mg^{27} 6=3146
Mn, neutron bombard. 6=1536, 5394
Mn^{52} 8=5308
  oriented 7=8806
Mn^{55} 5=2187; 8=8305, 9062; 9=3919
Mn^{55}(p,p$^1\gamma$) 9=2758
Mn^{56} 8=8301; 9=11435
Mo^{90} 5=4915
Mo^{91} 5=4013; 7=2582; 8=740
Mo^{96}, due to neutron capture 9=2761
N^{14} 7=9817; 9=1752
  α-capture 5=8230
  α and d reactions 6=3977
  N^{14} (d) 5=514, 8217; 8=8303
  N^{14} (p) 5=8212, 8250
N^{15} 8=5324
N^{15}(α,γ)F^{19} 7=8818
N^{15}(d,p)N^{16} 7=3536
N^{16}, β-decay 6-2312
Na, inelastic neutron scattering 6=3158
Na^{22} 9=2705, 5972
Na^{23} + n 7=2602; 9=2764
Na^{23}(p) 5=1179-80
Na^{23}(p,γ)Mg^{24} 9=7335
Na^{25} 5=7331, 9051; 6=7654
Nb^{89,89m} 5=2127
Nb^{90} 5=3051, 4915; 8=3330, 4273
Nb^{93} 7=8170; 8=9062
Nb^{94} 5=9852
Nb^{97} 6=5356; 7=6496
Nd Coulomb excitation 5=2166
Nd^{141} 8=5304
Nd$^{142-6}$ 8=7388
Nd^{147} 5=4018; 9=599, 1734
Nd^{148,150} 8=7388
Nd^{151} 9=12645
Ne^{21} 7=1563; 9=13646
Ne^{22}(p,γ)Na^{23} 9-585
Ne^{23} 6=1529; 7=3582
Ne^{24} 6=3949
Ni 7=2531, 7294
Ni^{57} 7=8797; 8=3334
Ni^{58} 8=8316
Ni^{59}, continuous (inner bremsstrahlung) 6=4613
Ni^{60} 8=8316
Ni^{61} 6=3143
Ni^{61}(p,p$^1\gamma$) 9=2758
Ni^{66} 6=4600
Np^{235} 6=5354
Np^{237} 8=5366
Np^{239} 6=2363
O^{16} 5=9060; 8=5333; 9=8521, 10025-6
  photodisintegration 7=9390
  resonance at 11.2 MeV 9=2818
O^{17} 9=13646
O^{18}, α-bombarded 6=6149
Os, N^{14} bombarded 7=5614
Os$^{180-3}$ 9=2721
Os^{185} 7=9358; 9=2721, 2753
Os^{188} 6=4612; 9=11460
Os^{189m,190m} 9=2766
Os^{191,193} 9=2731, 2740
P, proton-bombarded 7=2601
P^{28} 5=7320
P^{29} mirror nucleus 5=2126
P^{31} 8=9062; 9=3831-3, 3919
  d bombard. 6=628
  P^{31}(p,γ)S^{32} 9=7335
P^{32} 5=3071
  β-decay 7=7340-1
  β–γ coincidence 9=5002
  bremsstrahlung 5=3068
Pa^{230} 6=3148
Pa^{234}(UX) 6=3153, 6114

Gamma-ray spectra - contd
Pa^{234}(UX$_2$ and UZ) 5=1147
Pb, isomeric transition energies 7=647
  n-deficient isotopes 5=4007-9
Pb^{204m} 5=479; 7=6492
Pb^{206} 8=6268 9006
Pb^{208}, (ThD), energetic part det. 6=621
  photog. emulsion tech. 5=492
Pb^{210}(RaD) 6=6875; 7=9368; 9=3882
Pb^{212} 9=632
Pd$^{98-9,101}$ 6=8942
Pd^{103} 5=2999, 8187; 6=8942
Pd^{105m,109m} 9=6099
Pd^{112} 5=4912
Pm$^{143-4}$ 9-6075
Pm^{147} 7=2596, 7340
Pm^{148} 9=12642
Pm$^{150-1}$ 5=2118, 4018
Po neutron sources 5=5614
Po—Li and Po—Mg neutron sources 7=6515
Po^{206} 8=6240
Po^{207} 9=6063
Po^{209} 5=8210
Po^{212} 5=4003; 7=3610
Po^{214} 5=9057-8; 8=5278; 9=11458
Pr^{135} 5=1146
Pr^{136} 5=1146; 9=2723
Pr^{137} 9=2723
Pr$^{138-9}$ 5=1146; 9=2723
Pr^{142}, rel. to mag. orientation 9=3820
Pr^{143}, β-decay 7=7340
Pr^{144} 5=1163, 2146; 8=1920
Pt^{191} 6=1537; 7=8795
Pt^{192} 7=8795, 5331; 9=12665
Pt^{193m} 6=1537
Pt^{195m} 6=1537
Pt^{196} 9=641
Pt^{197} 6=1537
Pt^{199} 7=3595
Pu^{237} 9=619
Pu^{238} 7=2607
Pu^{239} 7=9317
V, Coulomb excitation 7=2531
  neutron bombard. 6=1536, 5394
V^{47} 7-2573
V^{48} 5=8188; 8=3329
Ra and its decay products 9=1744
Ra^{224} 8=5295, 5299; 9=632
Ra^{226} 5=2151; 6=656; 8=2554
Rb, Coulomb excitation 7=2531
Rb^{79} 7=7366
Rb^{84} 6=617
Rb^{84m} 9=630
Rb^{86} 5=4010
Rb^{88} 5=3047; 6=2349
Rb^{89} 6=3935
Rd^{106m} 5=5609
Re$^{180-1}$ 9=2721
Re^{182} 9=6078
Re^{183} 9=2721
Re^{185} 7=3633, 8776
Re^{186} 6=1540, 2347
Re^{187} 7=3633; 9=4994
Re^{188} 6=1540, 2347; 7=2587
Rh, from thermal-neutron capture 7=4678
Rh$^{98-9}$ 6=2344, 8942
Rh^{101} 6=8942
Rh^{102} 5=4011, 4034, 7330; 6=5364
Rh^{103}, neutron-bombarded 7=8170; 8=1981, 3352
Rh^{105} 5=4892
Rh^{106} 6=1523; 9=2752
Rh^{107} 8=9028; 9=6100
Rh^{108} 9=6100
Rn^{218} 7=1553
Rn^{220,222} α-decay 6=4605
Ru^{85} 8=7388
Ru^{87} 8=7388
Ru^{95} 6=7648
Ru^{97} 6=5356
Ru^{103} 5=2999, 3052, 6416; 6=5356; 8=1927
Ru^{105} 6=5356
Ru^{106} → Rh^{106} → Pd^{106} 9=10075

Gamma-ray spectra - contd
- S^{32-3} 8=7361
- S^{35}, β-decay 7=7340
  - $\beta-\gamma$ coincidence 9=5003
- S^{37}, transition in coincidence with β-decay 6=6128
- Sb, 15 min 5=9040
- Sb^{117} 5=2125
- Sb^{122} 5=2116, 5607, 9858; 6=1540
- Sb^{122} 3.5 min metastable state 5=4898
- Sb^{124} 5=2115; 7=6510; 8=1969, 6272
- Sb^{125} 6=5355
- Sb^{126} 9=3836
- Sb^{127} 6=3947; 7=664
- Sb^{128} isomers 9=3835
- Sb^{129} 6=3947
- Sc^{40} 5=7320
- Sc^{47} 6=1527; 7=2573
- Sc^{48} 8=3329
- Se, neutron-deficient isotope 7=7323
- Se^{72} 7=7366
- Se^{73} 6=3140
- Se^{75} 5=9001; 8=3333
- Se^{76} 8=8302
- $Se^{80}(p,n\gamma)Br^{80}$ 9=2758
- Se^{83} 8=1922
- Se^{83m} 9=6071
- Si^{28} 5=514; 8=4300; 9=10106
- Si^{29} 8=7361; 9=10106
- $Si^{29}(p,\gamma)P^{30}$ 6=2404; 9=651, 13664
- Si^{30} 9=10106
- Sm^{149} 8=1981, 3352
- Sm^{151} 9=7325
- Sm^{152} 9=11460
- Sm^{153} 5=9041; 6=7655; 9=599, 3872
- Sm^{154} 8=4286
- Sn^{113} 6=2368, 5364; 8=1232, 9=631, 7325, 12647
- Sn^{125} 7=3597
- Sr^{82} 8=8290
- Sr^{90} + 7^{90}, internal and external bremsstrahlung 8=6252
- Sr^{92} 7=3585
- Ta(p) 5=7362
- Ta^{180} 8=2541
- Ta^{181} 6=6874; 8=8332
- Ta^{182} 5=4027; 7=6516; 8=7335
- Ta^{183} 5=4027, 6418; 7=6516
- Ta^{184} 5=5600
- Ta^{185} 5=6418
- Ta^{186} 6=3132
- Tb^{152} 9=12640
- Tb^{154} 9=6079
- Tb^{155} 9=10105
- Tb^{156} 5=9848; 9=6079, 12648
- Tb^{160} 6=5351; 8=4272; 9=3872
  - internal conversion 9=10062
- $Tb^{161} \rightarrow Dy^{161}$ 6=8345; 7=2586; 9=6233
- Tc^{95} 5=4911
- Tc^{97} 6=607
- Tc^{98} 6=604
- Tc^{99} 8=2534; 9=10023
- Tc^{104} 7=650
- Te, Coulomb excitation 6=1609
- Te^{121} 8=1232
- Te^{122} 8=8302
- Te^{124}, due to neutron capture 9=2761
- Te^{127} 6=609, 6113
- Te^{129} 5=8211, 6=609, 1532, 2338
- Te^{131} 5=4014, 8211
- Te^{132} 8=5297
- Te^{133m} 8=6277
- Th^{226} 7=1553
- Th^{228} 5=2151; 8=5295; 9=632
  - and its products 7=3610
- Th^{230}(Io → Ra) conversion electrons 5=2157
- Th^{231} 9=12629
- Th^{234}(UX) 5=1147; 6=3153, 6114
- Ti, neutron capture 6=1536
- $Ti^{49}(p,n\gamma(V^{49}$ 9=2758
- Ti^{51} 5=2121, 4019, 6421-2
- Tl n-deficient isotopes 5=4007-9
- $Tl^{197,198m}$ 6=2346
- Tl^{200}, Tl^{210} (Rac^{11}) 7=8805, 9325
- Tl^{202} 7=8805; 8=3331

Gamma-ray spectra - contd
- Tl^{203} 5=7359
- Tl^{204} 5=4006, 9855; 9=3872
- Tl^{205} 5=7359
- Tl^{208} 7=1572, 3614; 8=5295; 9=632, 11457
- Tl^{210}(RaC^{11}) 7=1549; 9=11457
- Tm^{169} 7=3534; 8=9038
  - rotational states 6=1533
- Tm^{170} 6=6112; 8=3383
  - as source for industrial radiography 5=1430
- Tm^{171} 8=5328
- Tm^{172} 6=6106
- U fission products 7=3609
- U^{230} series 7=1553
- U^{232} 5=8189
- U^{233} 8=5366
- U^{235} 6=2372, 3137; 7=6517-18, 9317; 8=8358
- U^{238} 7=9317
- $U^{238}(n,\gamma)U^{239}$ 9=8634
- W^{178} 6=6105
- W^{181} 7=6495
- W^{182} 5=4027; 7=4665; 8=306, 1931, 7388
- W^{183} 5=4027
- W^{183m} 5=6418
- W^{184}, neutron-capture 9=12626
- W^{185} 5=4012, 5606; 7=6495 , 6498; 9=2732
- W^{185m} 5=6418
- W^{187} 7=6498
- Xe^{172} 5=3055; 9=2759
- Xe^{132} 7=3594
- Xe^{133} 9=7320
- Xe^{135} 5=3047
- Xe^{137} 9=7315
- Xe^{138} 5=3047
- $Y^{89}(n,\gamma)Y^{90}$ 9=8635
- Y^{90} 6=6133
  - β-decay 7-7341
- Y^{92} 5=8194
- Yb^{169} 6=1509
- Yb^{170} 9=11460
- Yb^{175} 5=5601; 6=1509, 1540
  - rel. to mag. orientation 7=3820
- Yb^{177} 5=5601; 6=1509, 6863
- Zn^{61} 9=11436
- Zn^{62} 5=478; 7=9842
- Zn^{63} 9=5023-4
- $Zn^{64}(d,\gamma)Ga^{66}$ 9=8604
- Zn^{65} 5=2151; 6=5364; 9=3872
- Zn^{67} 8=2534
- $Zn^{69,71}$ 5=3056
- Zn^{90} 9=7308
- Zn^{92} 8=8302
- $Zr^{92,94}$, neutron bombard. 6=7620
- Zr^{97} 6=5356; 7=667, 6496

Gamma-ray spectrometers (See also Beta-ray spectrometers; X-ray spectrometers).
- 2 accurate spectrometers (book) 5=6430
- automatic recording 9=3876, 8560
- bent-crystal, in Am^{241} study 5=3075
  - crystal reflectivity 8=4052
  - precision 6=1540
  - 7.7m focus 7=6415
- Cherenkov counter type 8=753
  - glass 7=8140
- coincidence apparatus, for low energies 7=3343 [5=9040
  - $\gamma-\gamma$ and $\beta-\gamma$ coincidence, with dual energy dispersion
  - $\gamma-\gamma$ and heavy-particle $-\gamma$ coincidence 6=2198
- collimator penetration and scattering effects 8=8962;
- collimator sensitivity patterns 8=9041 [9=11337
- Compton electrons mag. anal. 6=4619
- conversion processes, relative advantages 8=1252
- directional correlation meas. 9=8549
- double spectrometer, for coincidence counting of positrons
- DuMond bent-crystal type 9=5773, 8559 [8=7355
- for energy range 200-700keV 9=11335
- for neutron-capture γ-ray study 9=4879
- pair spectrometer, improved, high-energy 5=546
  - 3-crystal 8=8268
- with protional counters 5=4921
  - Compton backscattering 7=670
  - pulse size statist spread 6=2957
- pulse-height distrib. analysis 9=12530

- Gamma-ray spectrometers - contd
  - recording model 7=9857
  - scintillation 7=9390
    - with anticoincidence annulus of NaI(Tl) 9=8435
    - coincidence, fast—slow 5=7330
    - for comparison of nuclei radioactivities 8=2583
    - Compton effect reduction 7=1567
    - Compton, fast 6=7656
    - Compton, two-crystal 9=8433-4, 11338
    - Compton, with pulse addition 8=5329
    - for continuous spectra 7=666
    - counting threshold det. 7=1568
    - efficiency det. 8=3355
    - finite channel width effect 7=8133
    - for high counting rates, use in N_2 analysis 9=4882
    - high-energy response 9=7235
    - improved response 5=1942
    - log pulse-height response 5=9883
    - low-energy, review 9=2763
    - and magnetic, comparison 7=3610
    - medical 6=2373
    - NaI(Tl), construction and efficiency 6=3165
    - pair type, with wedge analyser 9=11458
    - photographic methods 6=3970
    - pulse-height data, analysis 9=5026-7
    - refinements 8=2555
    - resolution of larger NaI(Tl) scintillators 9=3691
    - resolution of photomultipliers 9=4869
    - source—crystal distance 5=4039
    - stabilizing, with counting-rate-diff. feedback 5=9725
    - summing type 9=13648
    - summing, using well-type NaI(Tl) 8=6276
    - total absorption, for high energies 9=4881
    - total absorption, response 9=2762
    - two-crystal, applications 6=2372
    - two-crystal, pulse summation 9=11334
    - use for mμsec time meas. 9=497
  - single crystal, spurious peaks due to backscattering 5=7335
  - sum-coincidence method 9=1762
  - use in radiochem. anal. 5=6443
  - X-ray escape gating 7=7981
- Gamma-rays (See also Cosmic rays, photons).
  - "age" equation for scattered quanta 8=6115
  - albedos of concrete and Al, Monte Carlo calc. 5=7338
  - in α-radioactive isotopes, review 7=3598
  - backscattered, appl. to thickness meas. 5=9450
  - β—γ coincidences, detection 5=4030
    - in internal Compton effect 8=6247
    - rel. to lifetimes of γ-transitions 6=595
  - β—γ correl., in 1st forbidden transition, time-reversal
    - invariance 9=5015, 6066
    - in oriented nuclei 8=6260; 9=1743
  - β—γ polarization correlation, circular 8=5314-15
    - in decay of oriented nuclei 9=2742
  - circular polarization, following heavy particle emission,
    - correl. 9=7242
    - following neutron capture 7=7343
    - parity non-conservation, review 9=3109
  - coincidences ratio method Cd^{111} mag. mom. det. 5=5586
  - collimation by circular cylindrical channel 7=2595
  - collimator penetration and scattering 8=8962
  - conversion length of high-energy photons 6=6136
  - from Coulomb excitation of nuclei 7=2528-9
    - even—even nuclei 9=652
    - yields 5=8213
    - yields and polarization 8=9036
  - Crab and Cygnus A as γ-ray sources 9=10544
  - 100 curie γ-irradiator 5=5615
  - 10 k.curie source, problems in routine use 5=500
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    - B^{11}(p,γ)C^{12} 7=672
    - Ba^{131}, $\gamma-\gamma$ ang. correl. 8=7354
    - Ba^{134} ang. correlation 6=622
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    - Dy^{163} 9=13647
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      - p$-\gamma$ ang. distrib. 9=3895
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    - Fe^{56}, $\gamma-\gamma$ directional correl. 7=8138
    - Fe^{57}, $\gamma-\gamma$ directional correl. 7=7344
    - Ga^{67} decay, ang. correl. 6=3157
    - Ga^{70}, $\gamma-\gamma$ ang. correl. 7=3596
    - Gd^{152}, directional correl. 9=6095
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    - Hf^{181}, $\gamma-\gamma$ ang. correl. 7=7331; 9=7318
    - Hg^{197}, conversion electron correl. 6=4624
      - $\gamma-\gamma$ ang. correlation 7=4674
    - Hg^{199} (44 min), $\gamma-\gamma$ correl. 6=3964
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  - Pb^{204} (1.1 hr), time-dependent $\gamma-\gamma$ directional correl.
  - Pb^{204m}, ang. correl. 5=3974; 6=5372 [6=3963
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    - photoneutrons from U^{235} fission products, yield 6=1583
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  - $Li^6(d)$ 8=728
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  - N(p,n), 2.2. BeV protons 5=3097
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    - capture processes, search for 5=7358
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    - (d,d), branching ratio 5=8246
      - at high energies 6=8374
      - high-energy collisions, H^{3} and He^{3} prod. 5=3099
      - high-energy collisions, triton prod. 5=515
      - neutron production 5=4070; 6=652, 2454, 3986, 6162
      - particles from, low D energy region, ang. distrib. 5=2177
      - theory 5=1194
      - 40 and 90 keV, cross-section and ang. distrib. 6=6160
      - 150 and 450 keV, cross-sections and ang. distrib. 5=1195
      - 6 and 14 MeV 7=8828
    - (d,n), abacus for neutron energy calc. 5=9085
      - angular distrib. of products 7=4724
      - 0.86 MeV ang. distrib. 5=5628
      - theory 5=1191, 4060; 7=6565; 8=8325
    - (d,2n) 8=9054
      - angular distrib. 5=3112
    - (d,p), angular distrib. of products 7=4724
      - angular distributions, numerical calc. 5=2183
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      - gross structure in proton spectra 9=13617
      - on heavy nuclei 6=3213
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      - statistical factor influence on cross-sections 6=4642
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  - theory 9=12677
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- use in chem. analysis of solid surfaces 7=6683
- 15 MeV, low-energy proton study 5=5631
- A, magnetic analysis 6=6161
- A^{40}(d,p)A^{41}, A^{41} separation by recoil 7=3568
- Al(d,p), mag. anal. of products (book) 5=6446
- Al^{26}, produced from Mg 5=3039
- Al^{27},γ-rays 6=628
- Al^{27}(d,α)Mg^{25} 5=2804; 6=2190
- Al^{27}(d,dαn) Na^{22}, cross-section 5=3101
- Al^{27}(d,d2pn)Na^{24}, at high energies 6=3191
- Al^{27}(dmn)Si^{28}, ang. distrib. of neutrons 8=336
  - energy levels of Si^{28} 7=2652
- Al^{27}(d,p) 9=2792
- Al^{27}(d,p)Al^{28} 5=2804; 6=2190, 3984, 7625; 7=3533
  - Al^{28} separation by recoil 7=3568
- Al^{27}(d,2p)Mg^{27}, yield 9=661
- Au^{197}, triton production 8=6304
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- B(d,n) 6=658
- B^{10}(γ-ray energies meas. 5=514
  - at 1.4 MeV, γ-ray spectrum 6=1538
- B^{10}(d,α)Be^{8}, Be^{8} low levels scarcity 5=8232
  - compound nucleus formation 6=8954
- B^{10}(d,α)Be^{8}* 7=1600
- B^{10}(d,n)C^{11} 7=1606-7, 2648, 5624, 6560; 8=5357
  - 4 neutron groups ang. distrib. 5=512
- B^{10}(d,p), nucleon exchange effects 8=2565
- B^{10}(d,p)B^{11} 7=1609, 3533, 5625, 6558; 9=658, 2800, 4980, 9=5045, 13611
  - compound nucleus formation 6=8954
  - proton and γ-ray groups study 6=2198, 7683
  - proton yield and ang. distrib. 5=511
- B^{10}(d,p)B^{11,11}* 9=3900
- B^{11}, γ-ray energies meas. 5=514
- B^{11}(d,n)C^{12} 5=1192, 5629, 8245; 7=709, 1606, 4720, 6563; 8=5357
- B^{11}(d,n)C^{12,12}* 9=3900
- B^{11}(d,n)C^{12}*, ang. distrib. of neutrons 8=2567
- B^{11}(d,p)B^{12} 7=3533
- Ba^{138}(d,p) 6=1575
- Be, absolute cross-sections 6=1572
  - emission angles 7=4625
  - excitation functions for scattering 5=3096
  - neutron generation 5=8244
- Be(d,n) 8=6301

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- Be^{9} 9=2754
  - excited levels of Li^{7} and Be^{8} produced 5=7369
  - γ-rays 5=8219
  - low-energy spectra 7=3652
  - magnetic analysis 6=3219
  - relative cross-sections calc. 5=9825
- Be^{9}(d,α)Li^{7}* 7=1505
- Be^{9}(d,d^{1}) 6=1557
- Be^{9}(d,He^{3}) Li^{8} 5=513
- Be^{9}(d,n)B^{10} 7=3658, 6625
  - neutron ang. distrib. 5=9080
  - neutron yield curve 6=1573
- Be^{9}(d,n)B^{10}*(γ)B^{10} 7=2599
- Be^{9}(d,nγ)B^{10} 8=8314
- Be^{9}(d,p)Be^{10} 7=5625, 8825
  - angular distrib. 5=1202, 4934, 7366
  - neutron spectra and ang. distrib. 8=5362
  - proton polarization 9=2800
- Be^{9}(d,p)Be^{10,10}* 9=3900
- Be^{9}(d,pγ) stripping reaction 9=6116
- Be^{9}(d,pγ)Be^{10} γ-rays 8=8314
- Be^{9}(d,t)Be^{8} 7=1505, 8825; 9=13656
  - angular distrib. 5=4934, 7366
  - Born cross-section 6=6892
- Be^{10},γ-rays 5=8219
- Bi^{209}(d,n)Po^{210} 9=7351
- Bi^{209}(d,2n)Po^{209} 9=7351
- Bi^{209}(d,3n)Po^{208} 9=7351
- Bi^{209}(d,xn) 8=6288
- Bi^{209}(d,p), ang. distrib. of p 5=1193
- Bi^{209}(d,p)Bi^{210} 9=7351
- C, stripping, proton polarization 7=1602
  - 19 MeV, ang. distrib. study 5=2180
- C(d,n) 6=658
  - cross-sections for high-energy neutron prod. 5=2175
- C(d,p) 5=1201
- C^{12} 9=660
  - γ-ray energies meas. 5=514
  - inelastic scattering 6=8372
  - magnetic analysis 6=3219
- C^{12}(d,α)B^{10} 7=4721; 9=5044
- C^{12}(d,d)C^{12} 7=2653
- C^{12}(d,dn)C^{11}, at high energies 6=3191
- C^{12}(d,n)N^{13} 6-656, 3220, 3222; 7=3656, 6556
- C^{12}(d,p) 6=1571
- C^{12}(d,p)C^{13} 6=3220, 3222; 7=2653, 3655; 8=5361, 7372; 9=658, 2799-800, 6114
  - angular distrib. 6=8375
- C^{12}(d,p)C^{13}*, angular distrib. 8=8264
- C^{12}(d,t)C^{11}, cross-section 6=656
- C^{13}, γ-rays 5=4918
- C^{13}(d,α)B^{11}, compound nucleus effects 6=6158
- C^{13}(d,n)N^{14}, neutron groups study 6=654
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- C^{13}(d,pγ)C^{14}, γ-rays 6=3977
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- C^{14}(d,γ)N^{16} 7=3587, 4719
- C^{14}(d,p)C^{15} 7=3587
  - excitation curve 5=1200
- Ca(d,p), mag. analysis of products (book) 5=6446
- Ca^{40}(d,p)Ca^{41} 7=706, 9876; 8=335, 6308
  - proton polarization 9=2800
- Ca^{40}(d,pγ) stripping reaction 9=6116
- Ca^{42}(d,p)Ca^{43} 7=3538, 8157
- Ca^{43}(d,p)Ca^{44} 5=3088
- Ca^{44}(d,p)Ca^{45} 7=8158
- Cl(d,α) 6=1575
- Cl(d,p) 6=1575
  - at 4 MeV 8=8326
- Cl^{35}(d,p)Cl^{36} 7=712
- Co^{59}(d,p)Co^{60}, Co^{60} levels and spin 9=1721
  - magnetic anal. 5=1198
- Cr, excitation functions and thick target yields 7=2650
- Cr^{52}(d,p)Cr^{53} 9=2795, 3828, 8600
- Cr^{53}(d,p)Cr^{54} 9=2795
- Cu, 190MeV, spallation 5=8231
- Cu^{63,65}(d,p)Cu^{64,66} 9=4977
- D(d,n)He^{3} 5=9081; 7=9878; 9=2797, 3707

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  D(d,n)He^{3}, angular distrib. 6=3985
   heavy-ice target for 8=3374
   in metals, formation of "self targets" 8=9055
   in metals, various 7=710
   neutron polarization 7=2651, 8159, 9387; 8=6151; 9=8599
   response of liquid scintillator 9=1319
   secondary effect from proton bombardment of heavy ice
  D(d,p)T, 10keV cross-section 8=4330 [9=10104
   proton energy spectrum, from Sceptre III 8=9050
   proton polarization 8=6305
  F, magnetic analysis 6=6159
  F^{19}, γ-rays 5=514, 8217
  F^{19}(d,α)O^{17*} 9=13646
  F^{19}(d,n)Ne^{20} 9=2794
   fast-neutron spectrom. study 6=2405
  F^{19}(d,p)F^{20} 7=6444, 8156; 8=2564; 9=10112
   proton groups, ang. distrib. 6=2408
  F^{19}(d,p)F^{20*} 9=10112
  F^{19}(d,t)F^{18} 7=4721
  Ga^{71}(d,α)Zn^{69} 9=12681
  H^{2}(d,p)H^{3}, proton polarization 7=6562
  H^{3}(d,n)He^{4} and He^{3}(d,p)He^{4} mirror reactions 5=9918
  He, light excitation 9=3969
  He^{3}, radiative capture of deuterons 5=1199
  He^{3}(d,p)He^{4} 5=9918; 7=1599; 8=1260; 9=1770, 13667
  He^{4}, resonance scatt., polarization 9=12604
  He^{4}(d,γ)Li^{6}, parity conservation 9=1757
  He^{4}(d,p)He^{5} 7=3653
  Hg^{196}, radiochemical study of Tl^{195,197,198m} 6=2346
  I^{127}(d,xn) 8=6288
  In^{115}(d,p)In^{116} 9=8601
  K^{39}(d,p)K^{40} 8=6308; 9=8602
  Kr^{78,80}(d,p) 7=1603
  Li(d,d^{1}), angular distrib. 5=4061
  Li(d,He^{3}), angular distrib. 5=4061
  Li(d,p), angular distrib. 5=4061
  Li(d,t), angular distrib. 5=4061
  Li^{6}, in emulsions 7=4617
   neutrons emitted 8=728
   T production 5=3102
   yielding excited Li^{6} 6=8326
  Li^{6}(d,α)He^{4} 7=705
  Li^{6}(d,nγ)Be^{7}, ang. correl. 7=1601
  Li^{6}(d,t)Li^{5}(p)He^{4} 8=5360
  Li^{7}, energy levels 6=6073
   neutrons emitted 8=728
  yielding excited Li^{6} 6=8326
  Li^{7}(d,α), high-energy α-spectrum 8=9053
  Li^{7}(d,α)He^{5}, ang. distrib. 7=7379
  Li^{7}(d,α)He^{5} $\rightarrow \alpha$ + n, ang. distrib. 8=3370
  Li^{7}(d,α)He^{5}(n)He^{4} 7=6559
  Li^{7}(d,n)Be^{8} 5=5629; 8=8270
   energy levels 5=6459
   neutron analysis 5=9082
   neutron ang. distrib. 9=5046
   neutron spectrum study 6=3215, 4677
  Li^{8}, energy levels 6=6073
  Lu^{176} 9=8591
  Mg, excitation functions for scattering 5=3096
  Mg^{24}(d,α)Na^{22}, Na^{22} levels study 9=13616
  Mg^{24}(d,p) 7=5625
  Mg^{24}(d,p)Mg^{25} 8=1222; 9=2801, 8603
  Mg^{24}(d,p)Mg^{25*} 9=13646
  Mg^{24}(d,p)Mg^{25*}(γ)Mg^{25} 7=7380
  Mg^{26}(d,p)Mg^{27} 8=1222
   stripping for formation of compound nuclei 6=8377
  Mn^{55}(d,α)Cr^{53} 9=3828
  Mn^{55}(d,p)Mn^{56} 8=8272
  Mo, prod. of Tc nuclides 9=690
  N(d,p) 5=1201
  N^{14}, γ-rays 5=514, 2149, 8217
   magnetic analysis 6=3219
  N^{14} + d $\rightleftharpoons$ C^{12} + α, time-reversal invariance 9=6118
  N^{14}(d,α)C^{12} 7=3531, 8778; 8=1965
  N^{14}(d,α)C^{12}, at 21 MeV 9=8606
  N^{14}(d,α)C^{12*}, at 21 MeV 9=8606
  N^{14} (d,$\alpha\gamma\gamma$)C^{12}, ang. correl. 5=3100
  N^{14}(d,d)N^{14}, at 21 MeV 9=8606
  N^{14}(d,n)O^{15} 6=657, 1576; 7=1607; 8=3375, 7373; 9=3899
  N^{14}(d,p) proton ang. distrib. 5=1202

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  N^{14}(d,p)N^{15} 7=3653; 8=1965, 8323
  N^{14}(d,pγ)N^{15} and N^{14}(d,nγ)O^{15}, γ-rays 6=3977
  N^{14}(d,t)N^{13} 7=3653
  N^{15}(d,α)C^{13} 7=3653
  N^{15}(d,α_0)C^{13}, at 21 MeV 9=8606
  N^{15}(d,n)O^{16} 9=3899
  N^{15}(d,n)O^{16*} 8=726
  N^{15}(d,nγ)O^{16} 8=8268
  N^{15}(d,p)N^{16} 7=1605, 3536, 3653, 4719
  N^{23}(d,n)Mg^{24} 7=9388
  Na^{23}(d,p)Na^{24} 8=3373, 9051
  Na^{23} (d,t)Na^{22} 8=9051
  Ne, magnetic analysis 6=6161
  Ne^{20}, proton groups, mag. anal. 5=4058
  Ne^{20}(d,n)Na^{21}, neutron thresholds 6=7685
  Ne^{20}(d,p)Ne^{21}, cross-sections 5=7368
   excitation function 5=8243
  Ne^{20}(d,p)Ne^{21*} 9=13646
  Ne^{20}(d,p)Ne^{21*} $\rightarrow$ (γ)Ne^{21}, γ-transitions 6=5368
  Ni, neutron production 7=6555
  Ni^{60}(d,2n)Cu^{60} 9=2804
  O(d,p), proton group anal. 5=1201
  O^{16}, magnetic analysis 6=3219
  O^{16}(d,α) 7=8826
  O^{16}(d,α)N^{14} 8=1261; 9=8606
   isotopic-spin selection rule violation 7=3650
  O^{16}(d,d) 7=8826
  O^{16}(d,n), n spectrum 7=6625
  O^{16}(d,n)F^{17} 6=657
  O^{16}(d,p) 7=8826
  O^{16}(d,p)O^{17} 8=6306, 7372, 8273; 9=5981, 10115
   absolute diff. cross-sections 5=5630
   angular distrib. 5=4934, 7365; 6=1577, 8375
  O^{16}(d,p)O^{17*} 5=5630; 7=4718
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   proton ang. distrib. 5=7367
  O^{17}(d,α)N^{15}, reaction energy 5=2179
  O^{17}(d,p)O^{18} 5=1197, 4059
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  O^{18}(d,α)N^{16} 7=4719
  O^{18}(d,n)F^{19}, energy levels 6=3221
  O^{18}(d,nγ)F^{19} 9=3896, 4979
  O^{18}(d,p)O^{19} 7=4717, 5553, 6557; 9=10034
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  O^{18}(d,p)O^{19*}, absolute diff. cross-section 5=5630
  P(d,p), at 4 MeV 8=8326
  P^{31}, γ-rays 6=628
  P^{31}(d,n)S^{32} 5=9083
  P^{31}(d,p)P^{32} 7=712, 8829
   ground-state doublet of P^{32} 9=659
  Pb^{206}, (d,p) 9=5047
  Pb^{206}(d,p)Pb^{207} 8=9006
  Pb^{207}(d,p) 9=5047
   angular distrib. 5=1193
  Pb^{208}(d,p) 9=5047
  Pb^{208}(d,p)Pb^{209} 9=7351
  Pt, search for Ir^{196} 9=10050
  Ru^{102}(d,p), study of Ru^{103} spin 9=10018
  S(d,p), at 4 MeV 8=8326
  S^{32}(d,α)P^{30} 7=2535; 8=9018
  S^{32}(d,p)S^{33} 8=9018
   angular distrib. 7=6568
   study of energy levels in S^{33} 6=7624
  S^{34}(d,p)S^{35} 8=9018
  Sc^{45}(d,3n), Ti^{44} production 7=5583
  Si(d,p), at 4 MeV 8=8326
  Si^{28}, γ-ray energies meas. 5=514
  Si^{28}(d,α)Al^{26} 9=8605
  Si^{28}(d,n)P^{29} 7=3656
  Si^{28}(d,p)Si^{29} 7=4723
  Si^{28}(d,pγ)Si^{29}, p$-\gamma$ correlation 7=2655; 9=2796
  Si^{29,30}(d,p)Si^{30,31} 9=12680
  Sn^{120}(d,p)Sn^{121} 9=8601
  Sn^{122,124}(d,αp)Cd^{119,121} 9=3848
  T(d), fusion chain-reactions 9=3936
  T(d,γ)He^{5} 5=7371
  T(d,n), neutron source 6=6529 [9=13667
  T(d,n)He^{4} 5=9918; 7=2649, 9877; 9=1770, 3707, 5981, 11404,
   appl. to fast neutron flux meas. methods comparison
   neutron polarization 8=6151 [5=4982

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    - T(d,n)He^{4}, neutron spectrum 6=6162
    - T(d,2n)He^{3} 8=2566
    - Te, prod. of Sb^{126} 9=3836
    - Th^{232}, triton production 8=6304
    - Ti^{46}(d,p)Ti^{47}, 4.16 MeV deuterons 5=9919
    - Ti^{48}(d,p)Ti^{49}; proton ang. distrib. 5=2182
      - 4.16 MeV deuterons 5=9919
    - U, fission yields, capture and stripping 8=8353
      - prod. of Tc^{104} 7=650
    - U^{235}, excitation functions 9=7352
      - prod. of Np$^{234-6}$ 9=598
    - U^{238}, excitation functions 9=7352
      - triton production 8=6304
    - U^{238}(d,2pn)Pa^{237} 5=476
    - V^{51}(d,p)V^{52} 9=657
    - Y^{89}(d,p), ang. distrib. 5=1193
    - Zn^{64}(d,γ)Ga^{66} 9=8604
    - Zn^{64}(d,n)Ga^{65} 9=4984
    - Zn^{64}(d,p), ang. distrib. and Q-values 9=3898
    - Zn$^{66-8}$(d,p), angular distrib. and Q-values 9=3898
    - Zn^{68}(d,p), ang. distrib. 5=1202
    - Zn^{68}(d,p)Zn^{69} 9=12681
  - electrons
    - deuteron disintegration, neutron polarization 8=1264
      - proton polarization 9=1771
    - electrodisintegration cross-sections, calc. 9=6120
      - rel. to photodisintegration 9=662
    - independent-particle model 6=6148
    - photobeta reactions in stellar interiors 9=13677
    - scattering, by deuterons, cross-sections calc. 6=6146
      - by even—even nuclei 7=3629
      - high-energy, model dependence 7=8813
      - inelastic, multipole transitions 5=1176
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      - single, of fast electrons by nuclei 6=6147
    - Be^{9}, elastic and inelastic scatt. 7=8148
      - electrodisintegration, rel. to bremsstrahlung effects and F^{19} data 9=3909
    - C^{12}, elastic and inelastic scattering 7=1584, 8148
      - electrodisintegration, rel. to bremsstrahlung effects and F^{19} data 9=3909
      - inelastic scattering 6=4633
    - Cu, electron energies from cascade showers 5=9068
    - Cu^{63}, disintegration 7=5612
      - electro- and photodisint. cross-sections 6=1554
    - D, 192 MeV, inelastic scatt. 5=4728
    - H, pion production 6=6203
    - Mn^{55}, disintegration 7=5612
    - N, low energy electrons, elastic 7=3358
    - O, low-energy electrons, elastic 7=3358
    - U, neutron prod. 5=5656; 7=763
    - U-Be, neutron prod. 7=763
    - W, 31, 40 and 60 MeV, cross-section model-independent 5=9831
    - Xe—e^{+} scattering 7=6535
  - gamma-rays (See Nuclear reactions due to photons).
  - helium-3
    - neutron production at high energies 8=4235
    - short-lived α-emitters from He^{3} and heavy ion bombardments 5=516
    - stripping reaction 9=7348
    - Al^{27}(He^{3},α)Al^{26} 9=7303
    - Au^{197}, triton production 8=6304
    - B^{10}(He^{3},α)B^{9} 9=10038
    - B^{10}(He^{3},n)N^{12} 8=1966
    - B^{10}(He^{3},p), mechanism 7=2625
    - B^{10}(He^{3},p)C^{12*} 9-10037
    - B^{11}(He^{3},p) and B^{11}(He^{3},d) 9=10116
    - Be^{9}(He^{3},n)C^{11} 9=6117
    - Be^{9}(He^{3},p)B^{11}, differential cross-sections 7=2626
      - proton ang. distrib. 6=659
    - Be^{9}(He^{3},pγ)B^{11} 9=2736
    - C, cross-sections for high-energy neutron prod. 5=2175
    - C^{12} 7=3631
    - C^{12}(He^{3},p)N^{14}, differential cross-sections 8=1967
    - C^{13}(He^{3},α)C^{12} 7=5613, 6569; 9=7347
    - C^{13}(He^{3},p), mechanism 7=2625
    - C^{13}(He^{3},p)N^{15} 7=8151
    - D, elastic scatt. at 29.2 MeV 9=12605
    - F^{19}(He^{3},α)F^{18} 9=7304
    - H^{2}(He^{3},p)He^{4} 5=3087

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  - helium-3 - contd
    - He^{3}, capturing reactions in stars 7=7356
    - (He^{3},2p), ang. distrib. calc. 5=3086
    - He^{4}, states in Be^{7} 9=3901
    - Li^{6}(He^{3},p), mechanism 7=2625
    - Li^{6}(He^{3},p)Be^{8}, energy levels 6=3193
    - Li^{7}, charged particle energies 5=1205
    - Mg^{24}(He^{3},α)Mg^{23} 9=7305, 8609
    - Mg^{24}(He^{3},p)Al^{26} 9=7303
    - N^{14}(He^{3},pγ)O^{16} 9=10025-6
    - Ne^{20}(He^{3},pγ)Na^{22} 9=2705
    - O^{16}(He^{3},α)O^{15} 9=7305, 10038
    - O^{16}(He^{3},p)F^{18} 9=586, 7304
    - Si^{28}(He^{3},α)Si^{27} 9=7305
    - Th^{232}, triton production 8=6304
    - U^{238}, triton production 8=6304
  - mesons (See also Cosmic rays, effects and interactions).
    - heavy particles, disintegrations 5=8227
    - hyperons, capture 5=8228
      - capture in emulsion 5=9967
      - charged, in emulsion 5=4094
      - charged, in flight, evidence 6=3283
    - negative heavy meson capture 6=700
    - strange-particle reactions, charge independence, consequences 6=6201
    - K-mesons, in emulsions 5=3134, 5623, 9138
      - exclusion principle effect 7=7363
      - interactions 5=4929, 7354
      - in D and H 6=3250
      - in He, absorption 7=4769
    - K^{0}, hyperfragment prod. 9=3794
    - K^{-}, capture with $_{\Lambda}$He^{5} emission 8=3384
      - in emulsions, capture 6=3183, 3975; 7=682
      - in emulsions, at 1.15 BeV/c 9=11396
      - in deuterium, capture 6=8368
    - K^{-} + He^{4} 8=6188
    - K^{+}, in emulsions 7=8188, 8873, 8880; 8=704; 9=2648, 9=3791, 3926, 6143
      - in emulsions, optical model calc. 7=8189
      - scatt. on nuclei, optical model 9=11486
    - K^{+} + C^{12} – K^{+} + 3He^{4} 7=3722, 5610
    - μ-mesons, capture 5=8228
      - capture by complex nuclei 9=8640
      - capture, electron production 6=2446
      - capture, 4-fermion interaction 8=2485
      - cross-sections 6=7136
      - electron emission, Fermi interaction range 9=13697
      - neutron production 7=7364
      - Williams—Weizsäcker theory 7=681
      - in C 8=2591
      - C(μ,β)β^{12}, muon polarization 7=9911
      - in Fe and Pb, impact electrons 9=3760
    - μ^{-}, capture ratio rel. to nuclear props. 8=278
      - K-capture 9=698, 13561
      - in light nuclei 9=7367
      - (μ^{-},n) reactions 8=2592
      - polarized, neutron ang. distrib. 9=8641
      - in Ag, neutron emission 9=6142
      - in C^{12} 9=8642, 12569, 13561
      - in Ca^{40} ang. distrib. and polarization of neutrons 9=8641, 9=12688-9
      - in Mg 7=4696
      - in Mg, neutron asymmetry 9=13698
      - in Na 7=4696
      - in O^{16}, ang. distrib. and polarization of neutrons 9=8641, 9=12688-9
      - in Pb, neutron emission 9=6142
      - U^{238} fission 9=13700
    - π-mesons, in emulsions 7=1582
      - in emulsions, optical model of nucleus appl. 5=1112
      - high-energy, cross-sections 7=9867
      - π-pair absorption with star production 7=684
      - review 7=9406
      - in C 6=4632
      - in Cu 9=12418
      - in graphite 9=12418
      - in H, 150-750 MeV, cross-section 6=638
      - in Pb 9=12418
    - π^{-}, absorption as cause of nuclear excitation 6=3976
      - absorption by light nuclei 6=7720
      - absorption, with neutron emission 9=13695
      - in emulsions 6=8952; 7=4697-8
      - in emulsions, at 4.3 GeV 8=2490

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  - mesons - contd
    - π^-, in emulsions, formation of π^+ 9=9981
      - in emulsions, σ-stars 7=4700
      - in emulsions, 1.5 BeV stars 6=2388
      - 300 MeV interactions 6=5423
      - low energy 8=1269
      - nucleon collisions, 1.5 BeV 5=7355
      - with protons, at 1 BeV 7=2622
      - with protons, at 1.4 BeV 5=3085
      - with protons, at 4.5 BeV 6=2387; 7=685
      - 1.5 BeV stars, hyperfragment disintegration search
      - in Ag, prod. of Pd, Rh, Ru 7=4699 [5=9945
      - in Al, at 225$\pm$ 10 MeV 7=4701
      - in Be 6=637; 7=1583, 2623
      - in C 6=637; 7=1583, 2623, 3625, 4701
      - in C, prod. of π^+-mesons 7=5654
      - in Cu 7=2623, 4701
      - in Cu, from cosmic rays 7=2621
      - in H_2 fluid target 9=12583
      - in He 7=4771
      - in He^4 8=6188
      - in O, 140-400 MeV 6=637
      - in Pb 7=2623, 3625, 4701
      - in Sn, at 225$\pm$ 10 MeV 7=4701
      - U fission, by slow mesons 6=2385
    - $\pi^- + d \rightarrow 2n + \pi^0$, parity of π^0 6=2444
    - $\pi^- + p = K^+ + K^- + n$, probable example 6=3258
    - $\pi^- + p \rightarrow n + \gamma$, use for π^- mass det. 5=546
    - $\pi^\pm$, in Li, 78 MeV 6=3279
      - in Pb, inelastic collisions 7=3627
    - π^+, absorption and bremstrahlung prod. 9=8474
      - charged fragment prod. in emulsions 8=8354
      - in Cu, from cosmic rays 7=2635
      - in liq. D, absorption 5=501
      - on neutrons, high-energy electron pair prod. 5=2206
    - Σ-hyperons, interactions in flight 6=1627
      - Σ—nucleon cross-section 7=9415
    - Σ^-, capture in emulsion 7=4770
  - neutrons (See also Neutrons, absorption; Nuclear fission).
    - activation analysis, error minimization 6=777
    - activities induced in water 7=7393
    - capture, by charge-density vibrations 6=8391
      - cross-sections 9=8570
      - cross-sections, by capture-gamma counting 5=1214
      - cross-sections, systematics 5=9100
      - γ-ray energy and intensity meas., review 9=7221
      - by non-spherical nuclei 8=6331
      - percent isomeric transition det. 9=12634
      - radiative, cross-sections calc. 9=13705
      - radiative, without compound nucleus formation 6=3231
      - thermal neutrons, γ-ray spectra 5=8219
      - thermal neutrons, with γ-ray emission 8=1981
      - by various nuclei 8=7386
      - 25-830 keV neutrons 8=7391
    - cloudy crystal ball model, 14 MeV 6=8388
    - collisions, cross-sections for 11 elements 9=3924
      - high-energy, diffraction theory 9=6139
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      - activation, of 50 nuclei 8=2583
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      - inelastic, at 1.0, 4.0 and 4.5 MeV 5=7374
      - at low energies 8=8349
      - reaction, for heavy nuclei 7=2679
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      - thermal neutrons 8=7252
      - for threshold reactions (data sheet) 9=12694
      - total, fast neutrons, meas. 7=3740
      - total, for 8 elements 8=346
      - total, high-energy, for 12 elements 5=8259
      - total, several elements, at 590 MeV 6=1589
      - 1.0, 4.0 and 4.5 MeV, 16 elements 5=4071
      - 2 to 100 MeV 6=6916
      - 14 MeV 5=4076
      - 120 and 380 MeV 6=7690
      - 765 MeV, total and absorption 8=1980
      - 1.4 BeV 5=7377
      - 4.5 GeV 9=6138
    - direct interactions in scattering 7=689
    - fragments, angular distribution 6=6891

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    - heavy nuclei, collective level excitation 6=5396
    - light elements, cross-sections for (α,n) neutrons 6=6167
      - (n,p) reaction products, search for 80 msec activity 9=6069
    - low-energy, effects of nuclear ground state nondegeneracy theory 6=676 [6=6908
    - medium weight nuclei, at 14 MeV 7=3672, 4737 9886
    - in minerals containing Re, age det. method 6=1760
    - (n,α) 6=8385
      - cross-sections 7=4738
      - cross-sections, 14 MeV 6=1592; 8=4323
      - cross-sections and ang. distrib., 1-19 MeV 8=6327
      - cross-sections for stable isotopes, rel. to nuclear conc. 9=6141
      - in medium-weight nuclei 9=5069
      - scattering, phase-shift anal. 6=4649
      - used for Si and Al analyses 7=4851
      - 14.5 MeV, $100 < A < 250$ 9=2830
    - (n,d), collision matrix 6=677
      - interactions, recoil deuterons, disint. protons, and (n,p) scatt. 5=3115
      - π^- production 6=2418
      - at 300 MeV 6=3211
    - (n,γ), cross-sections at 14.5 MeV 9=1783
      - γ-transitions and nuclear shell model 5=1106
      - with polarized neutrons 6=629
    - (n,n) interactions, indirect meas. 5=525
      - surface scatt., γ-ray ang. distrib. 6=2361
    - (n,2n) 8=2580
      - cross-sections 9=692
      - 14 MeV, mechanism 9=681, 3921
    - (n,np), 14 MeV 9=13688
      - 14.5 MeV, cross-section limits 7=724
    - (n,p), ang. distrib. 5=3112
      - collisions, π^+ production 5=7381
      - 400 MeV collisions, π^0—deuteron prod. 5=1241
      - 590 MeV collisions, π^0 production 6=3294
      - comparison with (d,p) reactions 7=9887
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      - cross-sections for stable isotopes, rel. to nucleon conc.
      - in medium-weight nuclei at 14 MeV 8=7389 [9=6141
      - proton polarization 6=3992
      - scattering at 14.1 MeV 5=3115
      - scattering at 300 MeV 5=9929
      - surface scatt., γ-ray ang. distrib. 6=2361
      - used for Si and Al analyses 7=4851
      - 12.5-17.5 MeV, excitation curves 6=3233
      - 13.4 and 17.5 MeV, proton spectra 8=8343
      - 14 MeV 9=13688
      - 14.5 MeV, $100 < A < 250$ 9=2830
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    - (n,t) cross-sections and ang. distrib., 1-19 MeV 8=6327
      - stripping and capture processes 9=2835
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    - optical model 8=2581-2; 9=2833 [5=7379
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    - pick-up reactions, exptl., review 8=1963
    - polarized nucleon scattering by nuclei 7=1392
    - radioactive nuclide production, choice of irradiation time
    - reaction width fluctuations 7=1619 [5=1172
    - recoil proton escape fraction, photog. plates 5=9104
    - resonances, (n,γ) detector for study 5=8300
      - keV, heavier odd elements 7=3667
      - keV, odd-intermediate nuclei 7=5635
      - rapid calc. 6=1596
      - in rare-earth elements 5=1215
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    - scattering, complex nuclear potential study 6=669

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    - elastic, fast neutrons on light nuclei, ang. distrib. 5=5642
    - elastic, on tritons 7=2678
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    - high-energy p—n—p double charge-exchange asymmetry 5=9074
    - inelastic, by deformed nuclei 6=1603
    - inelastic, by 13 elements 6=8960
    - inelastic, cross-sections for fast neutrons 6=674, 3234
    - inelastic, cross-sections, 55-140 MeV 6=6912-13
    - inelastic, γ-rays from 6=1539
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    - reaction and elastic, cross-sections, optical model 9=5063
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    - by spherical nuclei, and absorption 7=5634
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  - secondary emission of neutrons on neutron bomb. 9=687
  - size distrib. of neutron widths 6=671
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  - strength functions det. for fast neutrons 8=2528
  - tables for simplifying calculations 5=3109
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    - recent, review 8=5394
  - transmissions, exponential dependence, correction 5=4945
  - use of emulsions with embedded wires 5=1434
  - 3.2 MeV, on 30 elements, γ-ray prod. cross-sections 5=523
  - 4.1 MeV, interaction with 14 elements 5=5643
  - 0-400 MeV n—nucleus interaction 6=8919
  - A^{40}(n,α)S^{37} 5=4075
  - Ac^{227}, capture cross-section 6=6165
  - Ag, fast neutron scatt. 6=8390
    - fast scatt. cross-section 5=4072
    - resonance neutron expts. 9=10133
    - total cross-section, slow neutrons 5=1216
  - Ag(n,p) 9=8638
  - Ag^{107}, 14 MeV 8=5384
  - Ag^{107}(n,γ) 9=2761, 8630
  - Ag^{108}, radiative capture 8=6328
  - Ag^{109}, 14 MeV 8=5384
  - Ag^{109}(n,p)Pd^{109} 7=8837
  - Ag^{110}, radiative capture 8=6328
  - Al, ang. elastic scatt. 5=5637
    - proton emission 7=8839
  - Al^{27}, 14 MeV 8=5384
    - 15 MeV, energy levels det. 5=5635
  - Al^{27}(n,α)Na^{24} 7=5636; 8=1979; 9=8636
  - Al^{27}(n,γ) 9=8630
  - Al^{27}(n,p), cross-section rel. to Mg^{24} 5=1211
    - 14 MeV 9=6131
  - Al^{27}(n,p)Mg^{27} 7=3663, 7395
  - Am^{241}, Pu^{242} production 7=648
  - Am^{243}, total cross-sections 9=8629
  - As^{75}(n,p) 9=2820
  - Au, abs. value of resonance integral 5=521
    - n-capture, decaying to Hg^{199} 5=2189
    - total cross-sections, slow neutrons 5=1216
  - Au(n,p) 8=1977
  - Au^{197}, resonance, parameters 5=5640
  - Au^{197} (n,γ)Au^{198} 8=1981, 3352; 9=5068
  - Au^{197}(n,3n)Au^{195} 9=10135
  - Au^{197}(n,p)Pt^{197} 7=8169
  - Au^{198}, thermal neutron absorption 7=9060
    - thermal neutron capture cross-section 5=9103
  - B, capture with γ-ray prod. 8=5324
    - thermal neutron cross-section 7=8165
  - B(n,α), in flux meas. using emulsions 9=14014
  - B^{10}(n,α)Li^{7} 8=3323, 6329, 7377, 7522
    - ionization effects 9=3688
    - slow neutron cross-section 6=7695
    - use in B^{10} detection 7=3563
  - B^{10}(n,t) 9=2827
  - B^{10}(n,t)Be^{8}, ground state transitions 7=6578
  - B^{10}(n,t2α) and B^{10}(n,dn'2α), for 6-20 MeV 6=6909
  - B^{11}(n,α)Li^{8}(β^-)Be^{8*}(2α), 12-20 MeV 6=6910
  - B^{11}(n,p) 8=6238
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  - B glass, (n,α) reactions, radiation effects 9=4044
  - Ba^{131}, activation cross-section 6=3159

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  - Ba^{137m}, inelastic scattering 6=1604
  - Be, cross-sections 9=11483
    - gas formation, study after annealing 9=10270
    - neutron emission probabilities 7=8840
  - Be^{7}, disintegration by slow neutrons 5=4943
  - Be^{7}(n,α)He^{4}, parity conservation 8=1978
  - Be^{9}(n,α)He^{6} 7=7396
  - Be^{9}(n,2n) 7=5661
  - Be^{9}(n,2n)Be^{8} 5=520; 8=345, 2580, 4325, 7387; 9=3937,10129
    - direct breakup cross-section 6=7666
  - Be^{9}(n,t) 9=2827
  - Bi, neutron emission probabilities 7=8840
  - Bi^{209}(n,2n), formation of long-lived Bi^{208} 9=596
  - Bi^{209}(n,3n)Bi^{207} 9=10135
  - Br, neutron capture 8=5325
  - Br^{80}, isomeric nuclei formation 6=668
  - C, elastic scattering 5=4070, 5637, 6469
    - neutron polarization 7=1660
    - total cross-section 7=2673
  - C^{12}, 1.9-3.8 MeV elastic scatt. 5=3111
    - D—T neutrons, γ-radn. 5=9060
    - 14 MeV, γ-radn. 5=4038
  - C^{12} $\rightarrow 3\alpha$ disintegration 8=6335
  - C^{12}(n,n')3He^{4}, direct breakup cross-section 6=7666
  - C^{12}(n,2n)C^{11} 9=10136
    - use in neutron dosimeter 8=6097
  - C^{12}(n,n'3α), 12-20 MeV neutrons 5=9927
  - C^{12}(n,p)B^{12}, cross-section 9=6135
  - Ca(n,p) 8=1977
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  - Ca^{40}(n,α) 9=5069
  - Cd, cross-sections 9=12694
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    - at 100 MeV, search for resonance structure 9=8628
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  - Cd^{106}(n,p)Ag^{106} 7=8838
  - Cd^{111}(n,p)Ag^{111} 7=8838
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  - Cd^{113} (n,p)Ag^{113} 7=8838
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  - Ce, activation cross-sections 6=8944
  - Ce(n,γ) 9=10080
  - Ce^{138}(n,γ), Ce^{139} activation cross-sections 6=6860
  - Ce^{143}, capture cross-section 7=721-2
  - Cl, recoil P^{32} and S^{35} range, from (n,α) and (n,p) 6=1590
    - total cross-section 7=2673
  - Cl(n,γ) and Cl(n,p) 8=3323
  - Cl^{35}(n,α), cross-section at 14.8 MeV 9=2825
  - Cl^{35}(n,γ)Cl^{36} 9=6103
  - Cl^{35}(n,2n), cross-section at 14.8 MeV 9=2825
  - Cl^{35}(n,p)S^{35}, use of special AgCl emulsions 5=6472
  - Cl^{37}(n,α), cross-section at 14.8 MeV 9=2825
  - Cl^{37} (n,p), cross-section at 14.8 MeV 9=2825
  - Co, cross-sections 9=12694
  - Co^{59}(n,α)Mn^{56} 8=8340
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  - Cr, total cross-sections, 1-410 keV 8=2584
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  - Cr^{54}, neutron capture 7=4733
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  - Cu, cross-sections 9=12694
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  - Cu(n,2n), knock-out process 6=6915
  - Cu(n,p)Ni, proton energy distrib. 6=1591
  - Cu^{63}, 14 MeV 8=5384
  - Cu^{63}(n,γ) 9=8630
  - Cu^{63}(n,np) and Cu^{63}(n,p) 8=5388
  - Cu^{65}(n,γ) 9=8630
  - Cu^{65}(n,p) 8=5388
  - Cu^{65}(n,p)Ni^{65} 9=2825
  - D, total cross-section, 0.2-22 MeV 5=5641
  - Dy^{158}(n,γ)Dy^{159} 9=11477
  - Er, resonance 9=8632
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      - inelastic scatt. 5=9928
      - nuclear levels study 7=2532
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    - Fe, cross-sections 9=12694
      - cross-sections near 50 BeV 7=7361
      - inelastic scattering 7=9393
      - inelastic scattering, γ-ray spectrum 5=522
      - inelastic scattering, 2.5 MeV 5=9102
      - proton emission 7=8839
      - total cross-sections, 1-410 keV 8=2584
    - Fe(n,γ) 8=3323
    - Fe^{54}, 4.4 MeV, γ-radn. 5=9930
    - Fe^{54}(n,2n)Fe^{53} 8=2585
    - Fe^{54}(n,np), proton energy and ang. distrib. 9=8637
    - Fe^{54}(n,p) 8=1267
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    - Fe^{56}, 4.4 MeV, γ-radiation 5=9930
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    - Ga^{69}(n,p)Zn^{69} 9=12681
    - Ga^{71}, activation cross-section 9=11485
    - Gd, cross-sections 9=3920
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    - Ge^{74}, thermal activation cross-sections, isomeric ratio rule 8=8344
    - Ge^{74}(n,γ) 8=7388
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    - Ge^{76}(n,γ) 8=7388
    - Ge^{76}(n,γ)Ge^{77m}, cross-sections 8=2538
    - H and D, π^0-meson formation, 400 MeV neutrons 5=9146
    - H(n,γ)D 8=5633
    - He, π^- production 5=9970
    - He^3, elastic scattering 7=2678
      - total cross-sections 9=11478
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    - He^4, phase analysis 7=9394
      - 14.3 MeV scattering cross-section 5=3113
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    - Hg, resonance capture γ-rays 8=3354
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    - Hg^{199}(n,γ)Hg^{200} 8=1981, 3352
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    - I(n,γ) 9=10080
    - I^{127}, inelastic scatt. 7=9393
    - I^{127}(n,γ)I^{128} 8=1981, 3352; 9=5068, 7366
    - I^{127}(n,2n) 8=5382
    - In, resonances, radiation width var. 5=7375
      - total cross-section, slow neutrons 5=1216
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      - isomer prod. 9=4982
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    - Ir(n,γ) 9=10080
    - Ir^{192}, neutron capture 7=3584
    - K^{39}, charged-particle reactions 6=6168
    - K^{39}(n,α)Cl^{36} 9=2831
    - K^{39}(n,p)A^{29} 9=2831
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    - Li(n,γ) 8=5324
    - Li^6 7=4734
      - elastic scattering 6=2416
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    - Li^6(n,α) 8=3323
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      - inelastic scattering 5=2188
      - spin dependence of S-wave interaction 6=1593
    - Li^7(n,γ)Li^8 9=10131
    - Li^7(p,p')Li^{7*}(t)He^4, in emulsion 5=1212
    - methyl alcohol, inelastic scatt., molec. vibr. effect 5=4980
    - Mg, natural, fast neutron scatt. 6=8389
      - neutron capture 8=5325
    - Mg(n,γ) 9=13530
    - Mg(n,p), proton energies 7=723, 4737
    - Mg^{24}(n,p), cross-section rel. to Al^{27} 5=1211
    - Mg^{24}(n,p)Na^{24} 9=8636
    - Mg^{25,26}(n,p)Na^{25,26}, Mg^{26}(n,α)Xe^{23} 9=1779
    - Mg^{27}, n-capture 7=4733
    - Mg^{27} production, activation cross-section 6=3146
    - Mn, inelastic scattering 5=2187
      - thermal activation cross-section 5=8258
    - Mn^{55}, total cross-sections, 300-2500eV 6=675
    - Mn^{55}(n,α)V^{52} 8=8340
    - Mn^{55}(n,γ) 8=8305
    - Mn^{55}(n,2n) 8=5382
    - Mn^{55}(n,p) 9=2820
    - Mn^{56}, prod. from MnSO$_4$ soln., standardization of neutron sources 9=8464
    - Mo^{92}, 14 MeV 8=5384
    - Mo^{95}(n,γ) 9=2761
    - Mo^{98,100}(n,γ) 9=8630
    - N(n,γ) 8=5324
    - N^{14}, analysis 5=3110
    - N^{14}(n,d), pickup reactions 7=9889
    - N^{14}(n,p) 8=3323
    - N^{14}(n,p)C^{14} 9=8576
    - N^{15}, total cross-sections 9=13687
    - Na, activation cross-section 5=6473
      - thermal neutron cross-section 7=720
    - Na^{23}, slow-neutron capture γ-rays 7=2602
    - Na^{23}(n,γ)Na^{24}, cross-sections 9=5068
    - Na^{23}(n,2n), cross-section, 14.1 MeV 5=4944
    - Na^{23}(n,p)Ne^{23} 8=8348
    - Nd$^{142-6,148,150}$ (n,γ) 8=7388
    - Nd^{150} (n,γ)Nd^{151} 9=11477
    - Ni, cross-sections 9=12694
      - γ-rays 6=3966
      - total cross-section, slow neutrons 5=1216
    - Ni(n,p) 8=1977
    - Ni^{58}(n,α) 9=5069
    - Ni^{60}(n,p)Co^{60} 8=4321
    - Ni^{61}(n,α) 9=5069
    - Ni^{62}(n,γ)Ni^{63} 7=3589
    - NiO, total cross-section, slow neutrons 5=1216
    - Np^{237}, total cross-sections, 0.02-2.8 eV 7=9396
    - Np^{239}, capture cross-sections 9=8646, 13706
    - O^{16}, γ-radn. 5=9060
    - O^{16} (n,α)C^{13} 5=6471; 7=8167; 8=344
    - O^{18}, total cross-sections 9=13687
    - P, activation cross-section 5=6473
    - P(n,γ) 9=13530
    - P^{31}(n,p)Si^{31} 6=4650; 8=1979, 8342
    - Pa^{233}, capture cross-sections 9=13689
    - Pb, fast neutron scatt. 5=4072; 6=1633, 8390
      - fast neutron scatt., ang. distrib. 5=7376
      - neutron polarization 7=1620
    - Pb(n,γ) 8=3323
    - Pb^{204}(n,γ)Pb^{205}, capture cross-section 9=2733
    - Pb^{207}, capture cross-sections 6=3232
    - Pb^{207m}, excit., by inelastic scatt. 5=4077
    - Pd(n,γ), product of Pd^{111} isomers 7=8781
    - Pd^{108}, activation cross-section 9=11485
    - Pd^{108,110}(n,γ)Pd^{109m,111m} 9=11477
    - Pr^{141}, activation cross-sections 9=11485

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- neutrons - contd
  - Pr^{142}, activation cross-sections 6=1594
  - Pr^{143}, capture cross-sections 9=11474
  - n-propyl bromide, (n,γ), effect of γ-irradiation on yield
  - Pt^{198}(n,α)Os^{195} 9=2737 [5=10035
  - Pt^{199}(n,γ)Pt^{200}, cross-section 7=4662
  - Pu, cross-sections 9=3920
    - product of Bk and Cf nuclides 5=2120
    - total cross-sections, slow neutrons 6=7691
  - Pu^{238}, capture cross-section 8=347
  - Pu^{240} fission, thermal neutrons, cross-section 6=6172
  - Pu^{240,242}, total cross-sections 9=8629
  - Pu$^{240-5}$, effective pile capture cross-sections 9=13704
  - Rb^{88}, capture cross-section 8=4320
  - Re, slow neutron resonances 6=1597
  - Rh, proton emission 7=8839
  - Rh(n,p) 8=1977, 6332
  - Rh^{103}(n,γ)Rh^{104} 8=1981, 3352
  - Rh^{103}(n,p) 9=8638
  - Ru, product of Tc^{104} 7=650
  - Ru^{85,87}(n,γ) 8=7388
  - Ru^{104}(n,np)Tc^{103} 9=3866
  - S, ang.-elastic scatt. 5=5637
  - S(n,γ) 9=13530
  - S^{32}(n,α) 9=5069
  - S^{32}(n,α)Si^{29} 5=4069-70; 8=8341
  - S^{32}(n,p) absorption cross-section 6=8382
  - S^{32}(n,p)P^{32} 5=4069; 6=4650; 7=9890; 9=3922
    - P^{32} recoil range 5=8255
  - S^{33}(n,α) 9=5069
  - S^{34}(n,α)Si^{31}, cross-section 7=9890
  - S^{3} (n,γ)S^{35}, S^{35} recoil range 5=8255
  - Sb, resonance structure and cross-sections 9=8628
  - Sb(n,p) 9=8638
  - Sb^{121}(n,γ)Sb^{122m} 9=11477
  - Sb^{121}(n,p)Sn^{121} 7=8836
  - Sc, cross-sections 9=12694
    - slow cross-section 5=3114
  - Se^{81} isomer formation 5=6468
  - Si(n,γ) 9=13530
  - Si^{28}(n,p)Al^{28} 6=3235; 9=9636
  - Si^{30}, n-capture 7=4733
  - Sm, capture resonances 8=5385
    - cross-sections 9=3920, 5067
  - Sm^{149,151}, capture cross-sections 5=6477
  - Sm^{149}(n,γ)Sm^{150} 8=1981, 3352
  - Sn(n,p) 8=1977
  - Sn^{116,120}(n,p) 9=8638
  - Sr^{84,88}, activation cross-sections, slow neutrons 6=7693
  - Sr^{89}, capture cross-section 8=5383
  - T, total cross-sections 9=11478
  - Ta, neutron emission probabilities 7=8840
  - Ta(n,p) 8=1977
  - Ta^{181}(n,2n) 8=5382
  - Ta^{182}, capture cross-section 5=4074
  - Tb^{159}, neutron capture 6=8383
  - Tc^{98}(n,γ)Tc^{99m} 9=690
  - Te,γ-rays 6=3966
    - product of Sb^{126} 9=3836
  - Te(n,p) 9=8638
  - Te^{123}(n,γ) 9=2761
  - Te^{125m}, formation by (n,γ) reaction 9=13696
  - Th, fast neutron capture cross-section 7=8842 [9=2821
  - Th^{230}, thermal neutron capture and resonance absorption
  - Th^{232}, absorption cross-sections, thermal neutrons 5=9926
    - activation cross-sections, thermal neutrons 5=6474
    - resonance integrals 6=7692; 9=13707
  - Ti, γ-rays from thermal neutron capture 9=10132
  - Ti(n,p) 8=1977
  - Ti^{50}(n,γ) 9=8630
  - Tm, total cross-section, 0.038-1.56eV 7=725
  - Tm^{169}(n,γ)Tm^{170} 8=3383
  - U, inelastic scattering 6=6171
  - U^{235}, capture-to-fission ratio for fast neutrons 8=765
    - cross-sections 9=3920, 6132
    - resonance parameters 6=8959
    - resonance theory of neutron cross-sections 9=5073
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  - U^{236}, capture cross-section for pile spectrum 6=670
  - U^{238}, absorption cross-sections, thermal neutrons 5=9926
    - activation cross-sections, thermal neutrons 5=6474

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- neutrons - contd
  - U^{238}, capture cross-sections, fast neutrons 7=8842
    - radiative capture cross-sections 9-13705
    - resonance integrals 6=7692; 9=13707
    - resonance structure 7=3670
  - U^{238}(n,γ)U^{239} 9=8634
  - U^{238} (n,2n) U^{237} 6-10MeV cross-sections 9=1782
  - V^{51}(n,α)Si^{48} 8=8341
  - W, prod. of Hf^{183} 7=651
    - resonances 9=13690-1
  - W$^{182-4}$(n,γ) 8=7388
  - W^{184}, capture γ-rays 9=12626
  - W^{186}(n,γ) 8=7388
  - Xe, coherent scatt. amplitudes and electron—neutron interaction 6=6166
  - Xe^{135}, cross-section as function of energy 6=4652
  - Y^{89}(n,γ)Y^{90} 9=8635
  - Y^{89m}, inelastic scattering 6=1604
  - Y^{90}, activation cross-sections 6=1594
  - Yb, prod. of Yb^{177} 9=606
  - Zn, cross-sections 9=12694
  - Zn(n,p), proton energies 7=723, 4737
  - Zn^{64}, 14 MeV 8=5384
  - Zn^{64}(n,p)Cu^{64} 9=8639
  - Zn^{66}, 14 MeV 8=5384
  - Zn^{67}, isomeric state formation 6=7641
  - Zn^{68}(n,γ)Zn^{69*} 9=8639
  - Zr, inelastic cross-sections 6=3236
    - 14 MeV(n,α) and (n,p) cross-sections 5=9097-9
  - Zr(n,p), proton energies 7=4737
  - Zr^{94}, activation cross-sections 9=11485
- nuclei of $Z>2$
  - Cl^{36}/Cl^{34} from heavy ion bombard. 5=6447
  - comparison of nitrogen- and proton-induced reactions
  - compound nucleus formation 9=13674 [5=2176
  - high-energy, interactions and fragmentation probab.
  - Li^{7} ion induced 7=3630 [9=13670-1
  - N, at 100 MeV, with emulsion nuclei 7=2628
  - (N^{14},N^{13}), on six nuclei 8=1972
  - review 8=1982
  - Al, heavy ion bomb. distrib. of products 5=2169
  - Al(N) 6=4636; 9=13675
  - Al(N^{+},p) and Al(N^{+},α) 8=5396
  - Au, C^{12} scattering 9=3907
  - Au(N,4n), Au(N,5n), Au(N,6n) 8=1970
  - B(Li) 8=8329
  - B(N) 6=4635*
  - B^{11}(Li^{7},p)N^{17} 9=7302
  - B^{11}, Be^{8}, Li^{7}, range in emulsion 9=13672
  - Be(Li) 8=8329
  - Be(N^{14}), neutron transfer 7=5615
  - Be^{9}, in Coulomb field 5=9910
  - Be^{9} → Be^{8} + n, by heavy nuclei 7=5617
  - Be^{9}(Li^{7},p)C^{15} 8=6226
  - Be^{9}(N^{14}), energy distrib. of products 8=5367
  - Be^{9}(N^{14},αn)F^{18}, excitation function 6=1555
  - Bi,Pb(p), prod. of At by secondary capture of Li 9=2787
  - C(Li) 8=8329
  - C(N) 5=2168; 7=5615
  - C^{12}(N,α), C^{12}(N,2p) and C^{12}(N,2α) 7=6536
  - C^{12}(N^{14}) 8=6317
  - Cl(N) 5=7356
  - Cm^{244}(C^{13})No 8=317, 1231
  - Cm^{246}(C^{12},4n)No^{254} 8=6237
  - Co^{59} + Ne^{20} 7=8150
  - Cu(C) 7=7367
  - Cu(N) 6=2390; 7=1585, 7366; 9=13675
  - Cu(Ne) 7=1585, 7367
  - Cu(O) 6=2390; 7=1585, 7366-7
  - Cu^{63} + O^{16} 7=8150
  - In^{115}(N,3n), new chain Ba^{126}-Cs^{126} 5=1206
  - K(N) 9=5050
  - Li(Li) 8=8329
  - Li^{7}(Li^{7},p)B^{13}, B^{13} mass det. 6=5382
  - Li^{7}(N^{14} ions) 8=6317
  - LiF(N^{14}) 9=13675
  - Mg(N^{14}), neutron transfer 7=5615
  - Mg^{25}(N^{14},N^{13})Mg^{26} 8=325
  - N(N) 6=3175
    - elastic scattering 6=6144, 7733
  - N^{14}(N^{14}), adiabatic functions 6=8365

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  - nuclei of Z > 2 - contd
    - $N^{14}(N^{14})$, nucleon tunnelling 6=7667
    - Na(N) 7=1586, 5615
    - Ni(O) 9=12683
    - O(N) 6=4635*; 7=5615; 9=7355
    - $Ps(N^{14})$ 7=5614
    - $Pt(N^{14})$ 7=3632
    - $Pu^{239}(O^{16},4\text{-}6n)No^{251-3}$ 8=6316
    - $S^{32}(N^{14})$ 9=5049
    - $U(C)Cf^{244-6}$ 8=1971
    - $U^{238}(C^{12})$ 9=3906
    - $U^{238}(C^{12,13}, 4\text{-}5n)Cf^{245,246}$ 7=686
    - $U^{238}(C^{13,14})$, prod. of $Cf^{245,246}$ 9=13676
  - photons
    - α-particle production from several metallic elements 9=675
    - betatron calibration by C^{12}, O^{16}, Cu^{63}, Ag^{109} thresholds
    - cascade in emulsion 7=7198 [5=7095
    - cross-sections, for bremsstrahlung radiation 7=5626,7392;
      - from bremsstrahlung yield curve data 9=10123 [9=3912
      - of elec. quadrupole transitions, sum rules 7=5631
      - integrated, calc. 6=1584
      - Migdal's and Khokhlov's calc. 8=340
      - from yield curves 8=6320
      - for various nuclei at 10-30 MeV 9=5061
    - deuteron photodisintegration 5=517, 4940; 6=3223-5; 7=6574-5; 8=8333
      - amplitudes 8=1857
      - applied to n—p potential det. 6=1579
      - by 95 MeV bremsstrahlung 5=6466
      - charge density effect in deuteron 8=710
      - cross-sections 5=3105, 3996 [9=5062
      - cross-sections for far-forward and backward angles
      - cross-sections rel. to neutron—proton force 8=341
      - diff. cross-section, phenomenological theory 9=10125
      - exchange-current effects 8=7379
      - forward asymmetry 9=10126
      - $\gamma + d \rightarrow \pi^- + p + p$, spin-flip probability 9=696
      - by meson reabsorption 7=1614
      - nature of nuclear force 7=719, 6895
      - neutron yield and ang. distrib. 9=672
      - polarization 7=7386; 9=1768, 5059
      - proton polarization 9=3742
      - proton polarization and diff. cross-section 9=10124
      - proton production 8=2575
      - and p—p scattering 7=2657
      - rel. to effective range theory 8=6198
      - rel. to meson prod. 9=549
      - sum-rules 5=4062
      - at medium energies 8=762, 6325
      - at high energies 5=9923; 7=717, 3660
      - at 50-150 MeV 8=1976
      - at 130 MeV 9=2817
    - electron pair prod. in emulsions 7=1616 [5=492
    - emulsion detection of photoneutrons as γ-ray meas. method
    - ejection of high-energy nucleons and quasi-deuteron model
    - fast neutron component 7=8163 [6=4647
    - fission fragment distrib. 6=6891
    - (γ,α) reactions, in heavy nuclei 6=660
      - in medium and heavy elements 6=5392
    - (γ,d) reactions 9=1773
      - cross-sections, rel. to (γ,p) 7=9880; 8=3379, 5373
    - (γ,n) reactions in 10 elements, neutron yield 6=8361
      - isotope separation 7=7315
      - 50-neutron nuclides 7=2660
      - neutron spectra 8=7382
      - self-conjug. nuclei, yield 5=4938
      - in thick slabs, integral cross-section 5=9096
    - (γ,p) reactions, self-conjug. nuclei, yield 5=4938
    - (γ,np) reactions 9=1773
      - evaporation theory 9=2815
    - $(\gamma,p\alpha)$, emulsion study 6=2414
    - $(\gamma,p\pi^-)$ reactions, cross-section 7=4784
    - γ-polarization effects 7=8831
    - 315 MeV γ-rays in emulsions 6=3229
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      - collective description 6=3989; 9=10117
      - in disinteg. of rare earths 8=4317
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      - rel. to nuclear collective motions 8=9005

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  - photons - contd
    - giant resonance,resonance energy 9=667
      - and shell model (book) 5=6463
      - width 8=1974
    - ground-state nuclei formation 6=7689
    - high-energy, nuclei studies, survey 5=8982
    - independent-particle model and nuclear photoeffect 5=2184
    - isotopic spin selection rules, effect on yields 5=3107
    - meson production 7=5655
      - analysis 5=3441
      - cross-sections 6=2450
      - review 5=9921
    - μ-meson pair production 6=3227
    - π-meson prod., complex nuclei cross-sections 9=13686
      - double, matrix elements 5=1239
      - and nucleon isobars 5=3137
      - pairs 6=7688
    - π^0-meson production 5=2197, 8253-4
      - in Li, C, Al, Cu, Cd and Pb 7=7436
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    - π^+-meson production, Z dependence 7=4787
    - neutron—proton prod. on light nuclei 8=2573
    - neutrons and protons due to 65 MeV bremsstrahlung 5=3106
    - non-mesonic reactions, initiated by μ-mesons 6=4669
    - nuclear orientation dependence, Raman-type effect 9=7361
    - photodisintegration of the lightest nuclei 7=9884
    - photoeffect, collective aspects 5=9095
      - and complex potential-well nuclear model 6=1587
      - cross-section calculation 6=663
      - deuteron, and two-nucleon processes 6=2412
      - deuteron-model calc. 6=664
      - direct 8=5260
      - individual particle and collective aspects 8=3377
      - two models 8=7384
      - various models 9=1776
      - nuclear compressibility effect 5=1208
      - review 8=1973
      - theory 6=8926; 7=715-16
      - due to 24 MeV X-rays 9=665
    - photoelectrons, ang. distrib., expt. and theory 6=2120
      - ang. distrib., 0.41, 0.66 and 1.33 MeV 5=4905
      - emission from K-shell direction 5=7329
    - photoneutrons, high-energy, yield and ang. distrib. 5=9087
      - induced by Li^7 γ-rays 7=2658
      - standard, Th^{228}—D_2O source 9=12562
      - thresholds of 19 stable elements 8=2571
    - photonuclear processes, review (book) 5=6462
    - photoproton—proton coincidences from nuclei 6=662
    - photoreactions, ang. distrib. theory 5=6461
      - and the giant resonance 7=9811
      - resonance width and nuclear deformation 9=673
    - polarization of nucleons 6=5393; 7=2656
    - proton ang. distrib. 9=6003
    - proton—antiproton pair prod. 8=5381
      - diffraction production 7=8164
      - and nuclear star formation 8=9058
    - quadrupole moments and widths of giant resonance 7=718
    - radionuclide prod., use of linear accelerators 8=754
    - reaction energies, < 25 MeV, review 9=13681
    - recoil atoms, range meas. 9=5057
    - rel. to electron disintegration of nuclei 9=662
    - scattering, elastic 6=666, 3228
      - γ-rays by nucleons, cross-sections calc. 5=2153
      - γ-rays, resonance, review 7=9372
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    - shell effect study 5=9094
    - shell model, light nuclei 7=9391
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    - statistical theory, aids to direct calc. 9=1772
    - theory, nuclear model 6=2409
    - use of betatron 6=1588 [6=1578
    - X-ray induced, 1.5MeV, 15 elements, electron emission
      - 70 MeV, 7 elements, neutron energy and ang. distrib.
      - 320 MeV, yields 5=4067, 6465 [6=1580
    - A^{40}, cross-sections 9=1774, 10121
      - photodisintegration 8=8339
    - $A^{40}(\gamma,np)Cl^{38}$ 9=8618
    - $A^{40}(\gamma,p)$ 6=2410; 7=2665
    - $A^{40}(\gamma,p)Cl^{39}$ 9=8618
      - proton energies and angular distrib. 8=338, 9059

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  - photons - contd
    - Ag, photostar prod. in emulsions 7=4732
    - Ag(γ,α) 9=8625
    - Ag(γ,n) 5=3104
      - thresholds 9=3915
    - Ag(γ,p) 9=7345
    - Ag^{109}(γ,α)Rh^{105} 5=519, 6464
    - Ag^{109} (γ,nα) and (γ,t) 5=6464
    - Al, α-emission 7=7332
      - proton emission 7=3659, 8162, 9882
      - total cross-section 9=11472, 12686
      - by 17 MeV X-rays, photoneutron ang. distrib. 9=8458
    - Al(γ,p) 9=2819
    - Al^{27}(γ,n) and (γ,2n) 9=1777
    - Al^{27}(γ,n)Al^{26} 8=4316
    - Al^{27}(γ,2p)Na^{25}, 25 to 65 MeV 8=5377
    - As, neutron prod. 8=339
      - 70 MeV, yields 9=6125
      - 140 and 320 MeV, yields 6=3990
    - Au, neutron yeild, giant resonance 9=5054
      - protons 7=3659
    - Au^{197}, inelastic scattering 7=1613
      - photodisintegration, ratio of deuteron to proton yield [9=13683
    - B^{11}(γ,2p)Li^{9}, absolute cross-sections 8=5374
    - B^{11}(γ,π^-)C^{11} 9=676
    - Be, neutrons, ang. distrib. 5=518; 7=1611
      - protons 7=1612
      - by 17 MeV X-rays, photoneutron ang. distrib. 9=8458
      - at 319 MeV, principal cross-sections 6=6137
    - Be^{9}, deuteron production at intermediate energy 9=12685
    - Be^{9}(γ,n) 8=343
      - cross-sections 9=10122
    - Be^{9}(γ,n)Be^{8}, cross-sections 7=7388
      - neutrons, ang. distrib. 6=6164
      - polarization of neutrons 7=2656
    - Be^{9}(γ,2n)Be^{7}, integrated cross-section 8=2576
    - Be^{9}(γ,p) 8=2578, 8334
    - Bi, neutron production 6=8379; 7=5630
    - Bi^{209}, photodisintegration 7=3661
    - Br^{79}, chem. effects in propyl bromides 8=9170
    - Br^{81} (γ,α), (γ,nα) and (γ,t) 5=6464
    - Br^{81}(γ,n)Br^{80,80m} 7=4731
    - C, charged meson prod. 5=3139
      - fine structure 7=2662
      - neutrons, ang. distrib. 7=1611
      - neutrons, yield and angular distrib. 8=6326; 9=672
      - protons, yields and distrib. 7=1612, 9881-2
      - resonant absorption 6=6906
      - total cross-section 9=5055, 12686
    - C(γ,p), cross-section 9=10120
    - C^{12}, absorption cross-section 7=5628
      - by 330 MeV bremsstrahlung 5=4942
      - deuteron production at intermediate energy 9=12685
      - disintegration 6=1581
    - C^{12}(γ,3α) 5=3103; 7=2663; 8=5370, 8338; 9=2812
      - reaction mechanism 5=3108
      - 12-18 MeV, cross-sections 5=9091
    - C^{12}(γ,αp)Li^{7} 8=8338; 9=13672
    - C^{12}(γ,n) 7=4728
      - yield curve near threshold 6=2411
    - C^{12}(γ,n)C^{11} 9=10136, 11473
      - absolute cross-section 5=4941
      - activation curve 9=13680
      - activation curves, discontinuities 8=4316, 6320
      - chem. effects in carbonates 7=830
      - narrow isolated resonances, cross-sections 9=10119
    - C^{12}(γ,p)B^{11} 7=2663, 4728; 8=767, 2578, 8334
      - at 22 MeV reson., independent particle state 5=4937
    - C^{12}(γ,3p)Li^{9}, absolute cross-sections 8=5374
    - C^{12}(γ,pt)2α 8=8338
    - C^{13}, photodisintegration 7=6572
    - C^{13}(γ,p)B^{12}, cross-section 7=2659
    - Ca, photoproduction of charged mesons 6=6936
      - photoproton yield 5=4939
    - Ca^{40}(γ,p),fine structure of p-spectrum 9=13682
    - Ca^{40}(γ,pn) K^{38} 9=6121
    - Ca^{40}(γ,3p3n)Cl^{34} 7=9883
    - Ca^{44}(γ,p)K^{43}, integrated cross-sections 8=7385
    - Cd, photoneutron yield 5=4064
    - Cd$^{112-6}$(γ,p) 9=8622
    - Cl(γ,n) 7=9389

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  - photons - contd
    - Cl^{35}(γ,n)Cl^{34} 9=664
      - activation curve near threshold 5=9925
    - Cl^{35}(γ,n)Cl^{34,34m} 9=6123
    - Co, deuterons and protons 7=4727
      - high-energy spallation, yields and excit. curves 6=4646
    - Co(γ,p) 9=8621
    - Cr, neutron prod. 8=339; 9=669
    - Cs^{133}(γ,p)Xe^{132} 9=2814
    - Cu, α-emission 7=7332
      - deuterons and protons 7=4727
      - elastic scattering 7=8830
      - photon energies from cascade showers 5=9068
      - total cross-section 5=9924
      - by 17 MeV X-rays, photoneutron ang. distrib. 9=8458
    - Cu(γ,n) 5=3104, 4064
    - Cu(γ,p), cross-section and Cu nucl. temp. 9=6128-9
    - Cu(γ,p)Ni, proton spectrum data 6=5391, 6905
    - Cu^{63}, disintegration 6=5389
      - electro- and photodisinteg. cross-sections 6=1554
    - Cu^{63}(γ,n), thresholds 9=3915
    - Cu^{63}(γ,n)Cu^{62} 9=13681
      - Cu^{62} recoil 5=9090
    - Cu^{65}(γ,n) threshold 9-3915
    - D, meson production 5=8249, 8294
      - π^{0}, elastic 6=3226
      - π^{+} production 7=6618
    - D(γ,n), neutron yield and angular distrib. 8=6326
      - polarization of neutrons 7=2664, 8832
    - D(γ,p)n, polarization of nucleons at low energies 8=5375
    - D($\gamma,\pi^{\pm}$) 8=6168
    - F^{19}(γ,n), thresholds 9=3915
    - F^{19}(γ,p), proton energy and ang. distrib. 6=5390
    - Fe, total cross-section meas. 9=12686
    - Fe^{54}(γ,d) and (γ,nd) 8=6323
    - Fe^{54}(γ,n)Fe^{53} 8=6320
    - Fe^{54}(γ,2n) and (γ,pn), comparative yields 7=8835
    - Fe^{56,57}(γ,n) 9=674
    - Ga, 70 MeV, yields 9=6125
    - Gd^{160}(γ,n), giant resonances 9=2816
    - Ge^{70}(γ,n)Ge^{69} 9=663
    - Ge^{73}(γ,n), threshold 9=674
    - Ge^{76}(γ,n)Ge^{75} 9=663
    - H, meson production 5=9922
      - π^{0}-production 5=4065-6; 7=4785, 5656
      - π^{+} production 5=8291-2; 6=7724; 7=6618
    - H^{3}, photodisintegration, sum rules 7=7389
    - He, disintegration, sum rules 7=6573
      - disintegration, various processes 8=3380, 5379, 8336-7
      - π^{0} prod., elastic 5=1238, 9092
    - He^{3}, photodisintegration, sum rules 7=7389
    - He^{4}(γ,n)He^{3} 9=2813
    - He^{4}(γ,p) 5=1209
    - He^{4}(γ,p)T 8=1265, 3380
    - Hf^{177,179}(γ,n) 9=674
    - Hg, photoneutron yield 5=4064
    - I, neutron prod. 8=339
    - I^{127}(γ,n)I^{126} 7=6571
    - I^{127}(γ,p)Te^{126} 9=2814
    - In(γ,n), threshold 9=3915
    - In(γ,p) 9=7359
    - In^{115}(γ,γ')In^{115m} 7=2666
    - In^{115}(γ,2n)In^{113m} 7=2666
    - In^{115m}, photoexcitation 6=667
    - K^{39} 5=6464
    - K^{39}(γ,n)K^{38} 9=664
    - K^{39}(γ,nα) 5=6464
    - K^{39}(γ,nα)Cl^{34} 9=6122
    - K^{39}(γ,p)A^{38} 9=666, 2814
    - K^{39}(γ,t) 5=6464
    - Li, disintegration 8=5379
    - Li(γ,n) 8=5378
    - Li(γ,n)He, excitation function 5=9086
    - Li^{6}, photoneutron cross-sections 9=6124
    - Li^{6}(γ,d)He^{4} 9=10127
    - Li^{6}(γ,n) 7=5661
    - Li^{7}, photoneutron cross-sections 9=6124
    - Li^{7}(γ,α)H^{3} 5=1207, 2186
    - Li^{7}(γ,H^{3})He^{4} 6=661, 8378; 7=1610
    - Li^{7}(γ,2p), search for H^{5} 9=3914
    - Li^{7}(γ,t)He^{4}, excitation function up to 21 MeV 5=4063

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    - Lu^{175}, neutron threshold and cross-section 8=2572
    - Mg, neutron yield 7=2661; 8=8331
      - proton yield 5=4939
    - $\mathrm{Mg}^{24,25}$ 8=724
      - photoneutron cross-sections 5=7372
    - $\mathrm{Mn}(\gamma,\mathrm{p})$ cross-sections and Mn nucl. temp. 9=6128-9
    - Mo^{100}, proton yield 8=761
    - N, proton production 7=9881; 8=9056
    - N^{14}, photodisintegration 6=3991
    - N^{14}, (γ,α) 5=2186
    - $\mathrm{N}^{14}(\gamma,\mathrm{p}\alpha)$ 8=8338
    - $\mathrm{N}^{14}(\gamma,\alpha\mathrm{p})\mathrm{Be}^{9}$ 9=13672
    - $\mathrm{N}^{14}(\gamma,\mathrm{n})$threshold 9=3915
    - $\mathrm{N}^{14}(\gamma,\mathrm{p})\mathrm{C}^{13}$, resonant absorption 9=677
    - N^{15},proton production 8=5380
    - N^{17}, photonuclear yields 6=665
    - $\mathrm{Na}^{23}(\gamma,\mathrm{p})\mathrm{Ne}^{22}$ 8=1975; 9=2814
    - Nb^{23},(γ,n) and $(\gamma,2\mathrm{n})$ 9=668
    - $\mathrm{Nd}^{142,150}$ (γ,n), giant resonances 9=2816
    - $\mathrm{Ne}(\gamma,\mathrm{p})$ 7=9885
    - Ni, α-emission 7=7332
      - protons 7=7391, 8162
      - total cross-section 5=9924
    - $\mathrm{Ni}(\gamma,\mathrm{p})$ 9=2819
    - $\mathrm{Ni}^{58,62}$, disintegration, competititve processes 9=6127
    - $\mathrm{Ni}^{58}(\gamma,\mathrm{n})\mathrm{Ni}^{57}$ 9=8624
    - O, nuclear X-ray absorption, 15-25 MeV 9=2811
    - $\mathrm{O}(\gamma,\mathrm{n})$ 7=9389
    - O^{16} photodisintegration 6=1581, 3230, 5389; 7=4728, 9390
      - α-particle model 8=3378
      - shell model calc. 8=717
    - $\mathrm{O}^{16}(\gamma,\alpha)$ 5=6464; 8=6319
    - $\mathrm{O}^{16}(\gamma,\alpha)\mathrm{C}^{12}$ 5=2186
    - $\mathrm{O}^{16}(\gamma,4\alpha)$ 8=8338
    - $\mathrm{O}^{16}(\gamma,\alpha\mathrm{p})$ 8=8338
    - $\mathrm{O}^{16}(\gamma,\alpha\mathrm{p})\mathrm{B}^{11}$ 9=13672
    - $\mathrm{O}^{16}(\gamma,\mathrm{n})$, activation curves near threshold 5=9088
    - $\mathrm{O}^{16}(\gamma,\mathrm{n})\mathrm{O}^{15}$ 6=1582; 8=6320-1; 9=3915, 10119, 13681, 13684-5
    - $\mathrm{O}^{16}(\gamma,\mathrm{n}\alpha)$ 5=6464
    - $\mathrm{O}^{16}(\gamma,\mathrm{n}\alpha)\mathrm{C}^{11}$ 9=6122
    - $\mathrm{O}^{16}(\gamma,\mathrm{p})$ 5=8250; 7=714, 1612, 8833-4; 8=6319, 7381; 9=2818, 8619
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      - 14.7 MeV, resonant absorpt. 5=9824
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    - $\mathrm{P}(\gamma,\mathrm{n})$ 7=9389
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    - Pb, neutron yield 5=4064
      - neutron yield and ang. distrib. 8=342
      - by 17 MeV X-rays, photoneutron ang. distrib. 9=8458
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      - photoprotons 5=5634
    - $\mathrm{Pr}^{141}(\gamma,\mathrm{n})$, giant resonances 9=2816
    - $\mathrm{Pr}^{141}(\gamma,\mathrm{n})$ and $(\gamma,2\mathrm{n})$ 9=3918, 8623
    - Pu^{239}, fission, neutron yield 6=2413
      - photon emission 7=8161
    - rare earths, neutron yields 9=3916
    - $\mathrm{Rb}^{85,87}$ (γ,n) 9=674
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    - S, deuteron/proton yield 5=4939, 8252
      - total cross-section 9=12686
    - $\mathrm{S}^{32}(\gamma,\mathrm{d})$ and $\mathrm{S}^{32}(\gamma,\mathrm{nd})$ 8=6323
    - $\mathrm{S}^{32}(\gamma,\mathrm{d})\mathrm{P}^{30}$ 7=9880
    - $\mathrm{S}^{32}(\gamma,\mathrm{pn})$ 9=8627
    - $\mathrm{Sb}(\gamma,\mathrm{p})$ 9=6128
    - $\mathrm{Sb}^{121}(\gamma,\alpha)\mathrm{In}^{117\mathrm{m}}$ 9=6122
    - $\mathrm{Sb}^{123}(\gamma,\mathrm{pn})\mathrm{Sn}^{121}$ 9=6121
    - $\mathrm{Se}^{80}(\gamma,\mathrm{pn})\mathrm{As}^{78}$ 9=6121
    - $\mathrm{Se}^{82}(\gamma,\mathrm{n})\mathrm{Se}^{81}$ and $\mathrm{Se}^{82}(\gamma,\mathrm{n})\mathrm{Se}^{81*}$ 7=8160
    - $\mathrm{Si}(\gamma,\mathrm{p})$, proton ang. distrib. 9=670
      - proton yield 5=4939
    - Sm, photodisinteg. by X-rays 6=3988
    - $\mathrm{Sm}^{144}(\gamma,\mathrm{n})$ 9=12684
      - giant resonances 9=2816
    - $\mathrm{Sm}^{144}(\gamma,2\mathrm{n})$ 9=12684
    - $\mathrm{Sm}^{154}(\gamma,\mathrm{n})$ giant resonance 9=2816
    - $\mathrm{Sn}^{118}(\gamma,\mathrm{p})$ 9=2815
    - Ta, disintegration, n, 2n and 3n emission 7=7390

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      - neutron spectra 9=669, 5054
      - photoprotons 5=5634
    - $\mathrm{Ta}^{181}(\gamma,\alpha)\mathrm{Lu}^{177}$ 9=6122
    - $\mathrm{Ta}^{181}(\gamma,\mathrm{n})$ 8=2577; 9=10128
      - giant resonances 9=2816
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    - $\mathrm{Ta}^{181}(\gamma,\mathrm{p})\mathrm{Hf}^{180}$ 9=8620
    - $\mathrm{Tb}(\gamma,\mathrm{n})$, giant resonance 9=5054
    - Th, fission 6=1585-6, 7686
    - Th^{232}, fission 7=4730
      - neutron emission 7=1615, 8161
    - $\mathrm{Ti}^{46}(\gamma,\mathrm{n})\mathrm{Ti}^{45}$ 9=1775
    - $\mathrm{Ti}^{50}(\gamma,\mathrm{p})\mathrm{Sc}^{49}$ 9=1775
    - $\mathrm{Tl}^{205}(\gamma,\alpha)\mathrm{Au}^{201}$ 9=6122
    - $\mathrm{Tl}^{205}(\gamma,\mathrm{n}\alpha)\mathrm{Au}^{200}$ 9=6122
    - U, fission 6=1585-6, 7686
      - at 140-660 MeV 7=2647
    - U^{233} fission, neutron yield 6=2413; 7=8161
    - U^{235} fission, neutron yield 6=1583
    - U^{238} fission 5=8251; 7=4730
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    - $\mathrm{V}(\gamma,\mathrm{p})$ 9=5060, 8626
    - Zn, total cross-section 5=9924
    - $\mathrm{Zn}(\gamma,\alpha)$ 5=3104
    - $\mathrm{Zn}(\gamma,\mathrm{p})$ 7=5629
    - $\mathrm{Zn}^{64,66}(\gamma,\mathrm{d})$ and (γ,nd) 8=6323
    - $\mathrm{Zn}^{64,66}(\gamma,\mathrm{pn})\mathrm{Cu}^{62,64}$ 9=6121
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    - Zr^{91}, photoneutron cross-sections 5=7372
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      - 950 MeV, heavy nuclei 5=9077
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      - 0.95 GeV, light and heavy nuclei 7=690
      - 1 GeV,$(\mathrm{p}\alpha)$ with light and heavy nyclei 7=6542
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  - protons - contd
    - meson production, on d 7=7372
      - heavy, at 2.2 and 3.0 BeV 5=8293
      - p—Be, p—C 7=1598
      - p + p, heavy mesons 5=8295
      - p + p, π-mesons 7=1397, 1650
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      - K, energy distrib. 6=1560
      - $K^\pm$, in Be and Pb 9=2652
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      - π^0, 670 MeV, on various elements 5=9147
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      - π^+, at 0° by 335 MeV p on D and complex nuclei 5=9971
      - π^+, Z dependence 7=5620
    - multiply charged particle prod. 8=1959
    - neutron yields from thick targets 7=4789
    - nuclear cascade reactions 9=654-5 [5=7379
    - nucleon—nucleon cross-section at cosmic-ray energies
    - (p,a) and (p,ab), 100 MeV, cross-section calc. 5=6452
    - (p,α), in deformed nuclei 8=6291
      - with heavy nuclei in emulsions 8=6299
      - in light and heavy nuclei 9=1766
      - 23 MeV 9=3887
    - (p,d), collision matrix 6=677
      - in 5 elements, ang. distrib. of deuterons 6=3199
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      - pick-up deuteron, meas. at 95 MeV 6=3200
      - pick-up reaction, optical-model approximation 9=8598
      - 300 MeV bombard. of nuclei 6=3211
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      - cross-sections for 20 elements 6=1563
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    - A^{40}(p,n)K^{40} 9=6076
    - Ag, in emulsions 7=5623
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    - Ag^{107}(p,pn)$Ag^{106,106m}$ 9 7344
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  - Re^{185}/Re^{187}, quadrupole, ratio 7=9827
  - S^{33}, quadrupole 8=3422
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  - Tb, quadrupole 9=5054
  - Tl^{204} 7=9829
  - U^{233}, quadrupole 7=620, 4628; 8=5366
  - U^{233}/U^{235}, quadrupole, ratio 7=7306, 8783
  - U^{235}, quadrupole 7=2486, 9317
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  - U^{238}, quadrupole 7-9317
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    - low-lying 1-states 5=2073
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    - A^{36} 7=3611; 8=2560
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    - Ag^{108}, radiation and neutron widths 8=6328
    - Ag^{110} 8=6328; 9=4985
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    - Al^{26} 5=3064, 3092; 6=2395; 8=1240; 9=7303, 8605
    - Al^{27} 5=1184, 5635; 7=4706, 7375, 8824; 9=3919, 8605
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    - Al^{28} 6=2190, 7625; 7=3533, 3540, 4706, 6440; 9=7301
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      - 1st excited state, lifetime 9=4978
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    - Mg 5=1211, 2150, 3093; 7=1593, 6550, 7375, 9388; 8=724; 9=6098, 6106, 10073, 13662
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    - Mg^{25} 6=2190; 7=6436; 8=1222; 9=13646, 13662
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      - 3.899 MeV, parity assignment 9=8603
    - Mg^{26} 9=13662
    - Mg^{27} 7=7395; 8=1222
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      - nuclear temp. 9=6129
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    - Mn$^{53-4}$ 9=6108
    - Mn^{55} 5=2187; 7=9821; 8=9062; 9=3919, 10028-9, 13614
    - Mn^{56} 8=8272
    - Mo 6=3940; 7=9316
    - Mo^{95} 7=6445
    - Mo^{99} 9=2738
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    - N^{12} 8=1966
    - N^{13} 7=702, 3656, 9323; 8=8271
    - N^{14} 5=3110; 6=654, 8927; 7=668, 2533, 2606, 3631, 3640, 7=5556, 5600, 9817, 9889; 8=1261, 5350, 7305; 9=5039 9=7342, 8589, 13611
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    - N^{15} 5=1201, 6467; 6=1469; 7=3653, 7295; 8=6319, 7381; 9=12682, 13659, 13687
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      - 0.119 MeV state, lifetime 9=10036
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    - Na, neutron reson. study 8=2579; 9=686
    - Na^{21} 6=7685
    - Na^{22} 5=2158; 8=9051; 9=2705
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    - Na^{23} 7=2602, 3539, 7293; 8=9051; 9=2704, 12628
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    - Nb, neutron resonance study 9=685
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    - Ne^{20} 5=1190; 6=2406; 7=5555, 7293; 8=7264; 9=2794, 7307
    - Ne^{21} 6=5368; 7=9395; 9=13646
      - proton group leading to excited state, Q-value 5=4058
    - Ne^{22} 8=1975, 5387; 9=7307
    - Ne^{22}* 5=2158
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    - Ni^{60} 6=1521; 8=331, 7365, 8269
    - Ni^{61} 8=9026
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    - Np^{237} 5=8223
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      - populated by Am^{241} α-decay 6=6070
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    - Np^{237}* 5=443
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    - O^{14} 7=3631
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    - O^{15}* 7=3641
    - O^{16} 5=1187, 6467; 6=1565, 1581, 2312, 6832; 7=1508, 3645, 7=5554; 8=329, 717, 726, 1223, 6222, 6319, 7304, 8268, 8=9029; 9=3889, 6059, 6062, 8521, 11467, 13684
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      - charge distribution 9=5052
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      - O^{+} states 6=2313, 4579; 9=3825, 8594, 13605-6
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    - O^{18} 7=4620, 6580; 8=329, 5365, 6313, 8=8266; 9=6061, 13687

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    - Os^{188} 7=2587, 9322; 8=5312; 9=8516
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    - Os^{192} 6=1524; 7=9322
    - P, nuclear polarization 6=7618
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    - P^{30} 6=2404; 7=2535; 8=9018; 9=651
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    - Pa^{228} 7=1545
    - Pb^{201}, metastable states 5=9046
    - Pb^{202} 8=3317
    - Pb^{203} 5=9046; 9=604
    - Pb^{204} 5=4895; 9=603
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    - Pb^{206} 7=6441; 8=3318, 9006; 9=8515
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    - Pd^{103}, disintegration transitions 5=8187
    - Pd^{105} 8=9020
    - Pd^{106} 6=1523
    - Pm^{147}, 92 keV level, g-factor 8=7354
    - Pm^{151} 9=12645
    - Po^{207} 9=6063
    - Po^{210} 8=3321
    - Po^{212} 8=6241
    - Po^{214}(RaC^{1}) 5=9058; 8=5278; 9=11458
      - 1.416 MeV level, lifetime 9=12633
    - Pt, excited states due to neutron capture 9=13613
    - Pt^{192} 6=1524, 6129; 8=5331; 9=2702
    - Pt^{193} 7=8126
    - Pt^{194} 7=7291
    - Pt^{199} 9=12635
    - Pu^{238} 6=1545
    - Pu^{239} 6=2363, 5360; 7=5591, 9317
      - m μ sec metastable level 5=8203
    - Pu^{240} 6=1545; 7=5591
    - Ra^{222} 7=1558
    - Ra^{223} 8=4276
    - Ra^{224} 8=2554
      - first excited state half-life 9=1732
    - Ra^{226} 8=2554, 4275
    - rare-earth nuclei, neutron-deficient 9=597
    - Rb^{84m} 9=630
    - Rb^{86} 6=5357
    - Rd^{103}, isomer state excitation 7=6434
    - Re^{180}, metastable states 5=9046
    - Re^{185} 7=3633, 4683, 8776; 9=2753
    - Re^{187} 7=3633, 4683; 9=4994
    - Rh^{103} 5=2999; 8=1253, 1981, 3352
    - Rh^{105} 6=5357
    - Rn^{220} 9=12650
    - Ru^{223}(AcX) 5=7318
    - S^{32} 6=8371
      - excited states 5=9083
    - S^{33} 6=1575, 7624; 8=9018
    - S^{34} 6=7619, 7679, 8371
    - S^{35} 6=1575; 8=9018
    - Sb 8=1969
    - Sb—Te^{124} 9=10054
    - Sc 5=3114; 7=696
    - Sc^{41}, from Ca^{40}(p,p^{1}e + e^{-}) reaction 9=647
      - shell-model states 9=13607
    - Sc^{44} 6=1522
    - Sc^{45} 9=8584
      - ground-state energy 9=2689
    - Sc^{48} 9=6108, 12627
    - Se^{75} 9=4981, 6108

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Se^{76} 5=5608; 8=8302, 9037; 9=10076
Si^{27} 9=7305
Si^{28} 7=2652, 6442; 9=10106, 13661
1.777 MeV level 5=1184
4.62 MeV level, spin and parity 9=13612
Si^{29} 5=2126; 7=9815; 9=10106, 13664
Si^{30} 9=7346, 10106
Sm 6=1562; 8=5385
Sm^{148} 9=12642
Sm^{149} 8=1981, 3352
Sm^{152} 7=8127; 8=1918, 4286, 5282, 5332, 7302, 7306
Coulomb excit. study 9=653
Sm^{154} 8=4286, 7302
Coulomb excit. study 9=653
Sn isotopes 8=6314
Sn(165 ± 15 μsec) 9=3830
Sn^{113} 8=1232
Sn^{116} 9=3873
Sn^{125} 7=3597
Sn^{130}–Sb^{130} isobaric series 5=4863
Sr^{85} 9=6108
Sr^{86} 9=3857
Sr^{87} 9=6108
Sr^{88} 6=2349
Sr^{89} 6=3935
Sr^{92} 7=3585
Ta, level densities 8=6324
Ta^{180}, isomeric state, 8.15 hr 8=7310
Ta^{181} 6=6874; 7=3633; 9=7318
Tb 6=1562
Tb^{159} 7=1539; 9=1720
Coulomb excit. study 9=653
Tb^{161} 7=2589; 9=12644
Tc^{95} 7=7338
Tc^{97} 6=607
Tc^{99} 5=2130; 8=2534; 9=2738
Te^{122} 8=8302
Th^{226} 7=1558
Th^{228} 8=5273
Th^{231}, lower excited states 9=12629
Th^{232} 9=2829, 8515, 12651
Th^{234}, rotational 9=10039
Ti^{46*}, half-lives 7=6445, 6447
Ti^{47} 8=307
Ti^{48} 8=307, 1226
Tl 6=3940
Tl^{198} 8=3357
Tl^{202} 8=3317
Tl^{203} 7=6445, 9318
Tl^{208}, first excited state half-life 9=1732
Tm^{169} 6=1509; 7=2534, 3534; 8=5328, 6239
473 keV lifetime 9=602
Tm^{171} 7=3581; 8=5307, 5328
Tu^{169} 8=6281
U^{232} 5=8190
U^{233} 8=5366
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U^{234} 8=8274
U^{235} 6=8355; 7=9317, 9822-3; 8=1923, 7308; 9=688
U^{236} 6=8355; 7=3599; 8=8274
U^{238} 6=6171; 9=2829, 8515, 12651
V 6=5394
V^{49} 9=6108
V^{51} 5=6429; 6=3139; 9=3828
V^{52} 9=657
W 6=3940
W^{181}, isomeric state 7=4626
W^{182} 8=306, 7335; 9=6078, 12631
W^{183} 8=306
W^{184} 8=306; 9=12626, 12631
W^{186} 8=306; 9=12631
Xe^{130} 9=10051
Xe^{132} 7=3594
Y^{90} 9=3862, 8635
Yb^{169} 6=1509
Yb^{171} 8=7366
Yb^{172} 9=4992
Yb^{173} 8=7366
Yb^{175} 6=1509
Zn^{64} 8=307
Zn^{64}, excited levels 6=6127
Zn^{65} 7=8822; 9=6108
excited levels 6=6127
Zn^{66} 8=307
excited levels 9=1719
Zn^{67} 8=2534
Zn^{69}, isomeric and ground state yields in nuclear reactions [9=12681
Zn^{90} 8=3330, 4273
0 + first excited state 5=9000
$0^+ \to 0^+$ transition 6=6133; 7=1565
Zr^{90*}, predicted 0^+ level 5=8999
Zr^{92} 6=7620; 8=8302
Zr^{94} first excited state 6=7620
excitation (See Nuclear excitation).
magnetic moment (See also Gyromagnetic ratio; Molecules, internal mechanics, nuclear coupling; Nuclear magnetic resonance and relaxation).
atomic beam meas. method 8=7300
calc. on basis of j–j coupling, protons and neutrons 5=450
centre-of-mass motion effect 6=7627
classification 8=1904
collective model 7=7285
configuration mixing effect 5=451
odd nuclei 5=4872
conjugate nuclei, deviations 5=3975
correlation in kinematic model 8=4271
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distributions, from electron double scatt. 6=6703
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doubly odd nuclei 5=1118
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and elec. quadrupole energy rel. 6=3104
exchange contrib., modified shell model 5=9004
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light nuclei, on annular model 6=1474
magnetic multipole radiation, effect of configuration mixing [9=8509
magnetic shielding, variational calc. 5=4843
and many-body problem 7=7299
in meson field theory 8=6216
nuclear moments (book) 7=2537
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stable Ga isotopes 5=1119
odd nuclei in jj coupling 5=3000
odd–odd nuclei 7=1514
pairing in shell models 5=9830
polarization, by electron resonance saturation 5=2078
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proton mag moment 6=3917
quadrupole, symmetrical nuclei 7=9806
r.f. orientation method 8=2525
S$_{\frac{1}{2}}$-nuclei, deviation from Schmidt limits 6=3102
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Ac^{227} 5=7287
Ag^{111}, atomic beam study 7=609
Al^{27} 6=4562
Am^{241,243} 6=5320
ratio 8=108
As^{76}, gyromagnetic ratio 7=8785
B^{11}/B^{10}, ratio of g-factors 8=6215
Ba^{135,137} 6=6081
Be^{9} 5=9825; 6=4562
Bi^{209}, spin–orbit coupling contrib. to anomaly 9=10022
Br^{79}, from Zeeman splitting in nuclear mag. reson. 5=2953
Cd^{111} 9=7316
excited state 6=6848

- Nucleus - contd
  - magnetic moment - contd
    - Cd^{111}, 247 keV excited state 5=5586
    - Ce^{141} 5=3973; 6=2318; 8=310
    - Cl^{36} 5=7290-1
    - Co, from resonance spectra 8=309
    - Co^{56} 5=3972; 6=7631
    - Co^{57} 6=7631
    - Co^{58}, alignment 7=2549
    - Co^{58} ratio 5=9007
    - Co^{60} 5=4870; 6=3101
    - Cr^{53}, from paramag. resonance 7=4878
    - Cs^{127,129,130,132} 9=4966
    - Cs^{133}, 81 keV level 9=8551
    - Cs^{133,134,135,137} 7=3555
    - Cs^{134m} 5=3002-3, 8164
    - Dy^{161,163} 6=7630; 8=4269
    - Eu^{151}/Eu^{153}, ratio 5=3004; 8=585
    - Eu^{152} 7=6448; 8=311
    - Eu^{152m} 9=12616-17
    - Eu^{154} 8=311
    - F^{19} 6=558, 1475, 7626, 7629, 8327; 9=6093
      - second excited state 7=1513, 1543
    - Fe^{57}, rel. to electron spin reson. 8=2658
    - Ga^{60,71}, ratio 7-1515
    - Gd, from h.f.s. 6=3925
    - Gd^{155,157} 5=1682; 7=621; 8=585, 6214
      - from paramag. resonance 9=13600
    - H, correction to h.f.s. 9=5093
    - H^{3}, spin—orbit contributions 9=13599
    - He^{3} 7=7303
      - spin—orbit contributions 9=13599
    - He^{6} 9=1712
    - Hf^{177,179} 6=5318
    - Hg, radioactive 5=1681
    - Hg^{197}, dipole and isotope shift, by double resonance 9=12618
    - Hg^{197}*, dipole and isomeric isotope shift, from optical h.f.s 9=12619
    - Hg^{199,201} 9=13483
    - Ho 9=13598
    - Ho^{165} 6=2321
    - Ho^{167} 8=4441
    - I^{127} 6=2319
    - I^{131} 8=4268
    - In^{113,115}, octupole moment 7=7301-2
      - ratio 7=7300
    - In$^{114m, 116m}$ 8-1902
    - In^{116}* 7-619
    - K^{39}, atomic beam meas. 7=6476
    - K^{40}, intermed. coupling, Jensen—Mayer corr. 6=4583
    - Kr^{85} 5=7292
    - lanthanons(rare earth ions) 6=1480
    - Li^{6} 6=2416; 8=8275
    - Li^{7} 6=2416
    - Lu^{175} 9=1710, 2695, 4431
    - Lu^{176} 9=2695, 4431
    - Mn^{52} 7=8806
    - Mn^{53} 7=2543
    - Mn^{55} 6=6072
    - Mn^{56} 9=2691
    - Mo^{95,97} 6=2319
    - Na, and electron interaction 6=3051
    - Na^{23} 6=6072, 7626
    - Nd^{143,145} 5-1682
    - Nd^{147} 5=3973; 7=5563; 8=310
    - Ne^{21} 8=314
    - P^{31} 6=7626
    - P^{32}, by double-resonance method 8=718
    - Pb^{204m} 5=3974
    - Pb^{207}, magnetogyric ratio 7=5520
    - Pm^{147}, gyromagnetic ratio 9=2694
    - Pr 6=1479
    - Pr^{141} 8=4441
    - Pr^{142} 8=8265
      - orientation, rel. to γ-spectra 9=3820
    - Pu^{239} 8=1994
      - by nuclear magnetic induction spectrometer 9=3818
    - Rb^{81} 5=3970; 8=722
    - Rb$^{82-4}$ 8=722
    - Rh^{103} 5-7290
    - Ru^{99,101} 6=1044
    - Sb^{121,123} 6=2319
    - Sb^{121,123}, interaction with electron mag. moment, h.f.s.
    - Sc^{45} 9=2689 [9=592
    - Si^{29} 5=387
    - Sr^{87} 9=10021
    - Ta^{181} 5=9844; 8=4270; 9=1710
      - 480 keV level 6=1472
    - Tb^{159} 5=4871; 8=4441
    - Tc^{99} 9=10023
    - Tl^{198} 9 3815
    - Tl^{204} 7=9829
    - Tm^{169} 5=4512, 7283, 9008
    - U^{233} 7=4628
    - U^{233}/U^{235} ratio 7=7306, 8783
    - U^{235} 6=212, 6080
    - W^{183} 5=7290; 7=6450
    - Yb^{171} 6=7630
    - Tb^{173} 5=6897; 6=7630
    - Yb^{175} 7-8784
      - orientation, rel. to γ-spectra 9=3820
    - Zr^{91} 6=2319; 7=6451
  - magnetic resonance (See Nuclear magnetic resonance and relaxation).
  - spin (See also Gyromagnetic ratio; Molecules, internal mechanics, nuclear coupling).
    - angular momentum associated with slow-neutron resonances 7=2670
    - collective coordinate transformations, separation of Hamiltonian 9=8507
    - deformed nuclei 8=5279
    - det. from, circularly polarized γ-ray meas. 7=7343
      - elastic scattering data 8=5175
      - focused atomic beam method 5=2079
      - meson absorption expts. 5=9964
    - effect in (γ,p) and (γ,n) reactions 7=4728
    - electron scattering and centre of mass effects 9=2576
    - elongated nuclei, review of models 8=4265
    - from γ-ray polarization meas. 8=9036
    - general eq. of nuclear-spin system 9=5930
    - ground state (spin $\neq$ 3) 8=748
    - H—F coupling in 1,4 difluoro-2,3,6 trichlorobenzene 7=3544
    - Hahn spin—echo method 5=3976 [6=1040
    - information from high-resolution atomic spectroscopy
    - interaction of nucleon spin with nuclear rotation 7=8106
    - isotopic spin 9=13516
      - impurity in light nuclei 6=550
      - light nuclei, survey 6=1462
      - low-energy expt. data, review 5=9006
    - isotopic spin selection rules 7=3545
      - breakdown of rules 6=6843
      - dipole transitions 5=4867
      - rel. to photonuclear yields 5=3107
      - violation 7=3650
      - 6.88 MeV state of B^{10} 6=5307
    - level spins, from inelastic scattering meas. 8=1945-6
      - from internal conversion X-ray data 8=9032
    - meson field, spin-charge motion 6=4835 [6=6129
    - and multipole order assignments, La^{140}, Ce^{140}, Pt^{192},As^{75}
    - N^{15}(p,$\alpha\gamma$)C^{12} resonant states, spin and parity 7=6511
    - neutron excited levels, meas. 8=8263
    - nuclear spin system, liq. He^{3} 6=5817
    - nuclei with non-spherical potential 9=2689
    - nucleon charge and spin 6=4836
    - odd-mass nuclei, spin sequence in rotational spectra
    - odd—odd nuclei, generalizations 5=4866 [8=6221
    - 1f$_{7/2}$ shell nuclei 7=4613
    - orientation, Ge n—p α-counter studies 8=7965
    - Overhauser polarization effect 5=8163
      - spin resonance, metals 5=9016
    - polarization, after electron-capture 8=5317
    - precession, influence in intermed. states 5=9880
    - pseudovector nuclear hyperfine interaction 9=3814
    - r.f. induced transitions at elec. reson. freq. 5=2007-8
    - relaxation, in magnetic cooling 7=4285
      - in 2-proton systems 7=3546
    - in semiconductors, exchange mechanism 6=1232 [8=7298
    - short-lived states, gyromag. ratio, neutral beam study
    - spin coupling in nuclear paramag. relaxation 8=4266
    - spin dependence of level spacings 9=10027
    - spin-echo, quantum-mechanical anal. 5=2954
    - spin—electron—neutrino correlation in β decay 9=3813

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  spin—lattice relaxation in liquids 7=3549
  spin—orbit coupling, effect in mag. multipole radn. 7=4627
   in heavy nuclei 5=8997
   and tensor forces 8=301
  spin—orbit interaction 6=8325; 9=568
   and coupling 9=3816
   one particle levels 8=1911
   two-body, tensor operator methods 6=6068
  spin temperature 7=6452; 8=2523
  two systems interaction, in rigid lattice 9=6225
  some nuclei of mass 19 5=2071
  of nuclei with Z from 77 to 84 8=6223
  11 nuclei, from neutron—capture γ-ray study 9=3812
  A^{41} 6=6161
  Ag^{104} 8=7297; 9=13597
  Ag^{105} 8=5267
  Ag^{106} 8=5267, 7297; 9=13597
  Ag^{110} 8=5267
  Ag^{111} 6=546
   atomic beam study 7=609
  Al, neutron reson. study 9=686
  Al^{25} 5=9002; 6=3959-60; 7=1596, 8824
   excited states 8=1225
  Al^{26} 5=3092; 6=5384
  Al^{27} 6=4562; 7=8824
  Al^{28} 7=6440
  Am^{238} 7=5591
  Am^{241} 7=2539
  As^{72} 8=5306
  As^{75} 5=9001; 8=3333
  As^{76} 7=8785, 9825; 8=2525
  At^{210} 8=3321
  At^{211} 8=7299
  Au^{198} 6=1481, 3118
  Au^{199} 6=3118
  B^{10} 5=7332; 7=2636, 8777, 8779; 8=1968, 4305; 9=2754
  B^{11} 5=2174; 7=3529; 8=5283
  B^{11*} 7=5625
  Ba^{134} 5=9870; 6=622
   rel. to $\gamma-\gamma$ ang. correl. 5=8216
  Be^{8} 5=441, 4052; 6=7628
   spin—orbit coupling 9=3894
  Be^{9} 6=4562
   spin and parity of levels 9=649
   1.7 MeV state, spin and parity 8=9017
  Be^{10} 9=2754
  Bi$^{203-6}$ 9=1707
  Bi^{206} 8=6240
  Bi^{212} 5=2134; 6=2354, 6869; 8=5303
  Bi^{214} 6=3955
  Br^{82} 6=8943
  C^{11} 7=1606, 5624
  C^{12} 5=3100; 7=1606, 5562, 6539; 8=1924, 9=610, 4976
   9.6 MeV state, from pion scattering data 9=6025
  C^{13} 7=2630, 6545; 8=8264
   meas. by collapse of spin—spin splitting 5=1122
  C^{14} 5=9071
  C^{15} 5=1200; 7=3587
  Ca^{41}, doublet splitting 9=568
  Ca^{42} 9=10031
  Ca^{43} 9=12643
   excited levels 8=7346
  Cd^{110} 9=8550
   excited levels 8=1224
  Cd^{144}, ang. momenta and parities 6=6075
  Ce^{140}, excited state 5=4868
  Ce^{141} 8=310
  Ce^{143} 6=3142
  Cl^{33} 9=3829
  Cl^{35} 7=7347
   in NaCl, saturation by ultrasonics 9=5950
  Cl^{36} 5=7291
  Cl^{37} 7=7347
  Cl^{38} 6=1575
  Cl^{40} 7=9820
  Cm^{242} 9=8508
  Co^{56} 5=4869; 6=7631; 7=9369
  Co^{57} 6=7631; 7=8797
  Co^{58} 8=315
  Co^{60} 6=3101

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  Co^{60}, ground and first excited levels 9=1721
  Cr^{51} 5=4019
  Cr^{52} 6=6876
   1.44 MeV level 8=5359
  Cr^{54} 5=1117
  Cs^{127,129,130} 7=2544
  Cs^{127,129,130,132} h.f.s. separations 9=4966
  Cs^{134m} 5=8164
  Cu^{60} 8=7297
  Cu^{61} 8=7297
  Cu^{65} 8=7347
  Dy^{160}, excited levels 8=5277
  Dy^{161} 6=7630, 8345; 7=618
  Dy^{163} 6=7630; 7=618
  Dy^{165}, spin—parity assignment, shell model 9=10061
  Eu^{151} 5=3004
   spin and parity 9=635
  Eu^{152} 7=6448; 8=311, 1918, 4286
  Eu^{152m}, spin and parity 9=12616-17
  Eu^{153} 5=3004; 8=5276
   spin and parity 9=635
  Eu^{154} 8=311
  Eu^{155} 6-8943
  F, neutron reson. study 9=686
  F^{17}, 3.11 MeV level, spin and parity 8=1903
  F^{19} 5=1177, 1187; 6=2403; 7=7371, 8773
   in LiF, spin—lattice relaxation 9=1879
  F^{20} 7=8156
  Fe^{56} 5=9877
   spin and parity of excited levels 8=6270
  Fe^{57} 5=9035; 7=8782; 9=570
  Ga^{66,67} 7=6449
  Ga^{68} 8=4267
  Ga^{70} 7=3596
  Gd^{152} 7=8127; 8=5332
  Gd^{153} 8=5276
  Gd^{155,157} 7=621; 8=6214
  Ge^{72} 6=3141
  He^{3}, nuclear alignment 9=5943
   and volume anomaly 9=4524
  He^{5} 8=3370
  He^{6} 9=1712
  Hf^{177} 6=547, 5318
  Hg^{179} 6=5318
  Hf^{180m}, spin and parity 8=4277
  Hg^{197} 6=6884
  Hg^{200} 8=3354, 7346; 9=2755
  Hg^{202}, 439 keV excited state 5=7334
  Ho^{167} 8=4441
  I, in NaI, ultrasonically induced transitions 9=591
  I$^{123-4}$ 9=569
  I^{125} 8=4268
  I^{126} 5=7319
  I^{127} 9=2759
   excited levels 6=6113
  I^{128} 9=10017
  I^{130} 9=4965, 10017
  I^{131} 9-569
  In^{109,110m,111} 8=6211
  In^{114m,116m} 8=1902
  In^{116*} 7=619
  Ir^{192} 7=4671
  K^{38} 8=1234
  K^{39} 5=7284; 7=7347
  Kr^{83} 7=3541
  Kr^{85} 5=7292
  Li^{6} 7=4617; 9=10055
  Li^{7}, energy levels 8=8271
   in LiF, spin—lattice relax. 9=1879
  Li^{8} 9=611
  Lu^{175} 6=1508; 7=2534; 9=2695
  Lu^{176} 9=2695
   from LuII h.f.s. 9=13596
  Lu^{177} 6-6863
  Mg, neutron reson. study 9=686
  Mg^{24} 5=5626; 6=2405; 7=1593, 2636; 9=13662
   5.23 MeV state 9=10077
  Mg^{25} 7=5625, 6436; 8=1222, 5485; 9=13530, 13662
  Mg^{26} 9=13662
  Mg^{27}, spin and parity 8=1222

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  - spin - contd
    - Mn^{52} 8=3345
    - Mn^{53} 7=2543
    - Mn^{55} 7=7305
      - 1st excited state 6=1467
    - Mn^{56} 9=2691
    - Mo^{95} 6=2319, 5314; 9=13631
    - Mo^{97} 6=2319, 5314
    - Mo^{99} 5=2130
    - N^{13} 7=3656; 8=8271
    - N^{14} 6=2394; 7=1609
      - coupling to H, in nitro-organic cpds. 8=7318
      - spin assignments of 9.16 and 6.44 MeV states 7=12630
    - N^{15} 5=6470
    - N^{16} 6=6076; 8=5275, 5316
    - Na, in NaI, ultrasonically induced transitions 9=591
      - neutron reson. study 9=686
    - Na^{22} 5=2158
    - Na^{23} 7=2542; 8=7314
      - in NaCl, saturation by ultrasonics 9=5950
      - spin and parity 9=585
    - Na^{24} 8=3373
      - ground state 6=3949
    - Na^{25} 7=6436
    - Nd^{142} 8=8265
    - Nd^{147} 7=5563; 8=310
    - Ne 9=7365
    - Ne^{20} 5=1187; 6=3912; 7=694, 2636; 8=7364; 9=10099
    - Ne^{21} 6=6161; 7=2540; 8=314
    - Ne^{22} 5=2158
    - Ne^{23} 6=6161
    - Ni^{61} 8=6212
    - Np^{235} 9=598
    - Np^{237} 5=443; 7=8103
    - Np^{238} 9=2690
    - Np^{239} 5=2077; 7=9334; 8=6351; 9=3817
    - O^{15} 7=7342
    - O^{16} 8=1223, 8268; 9=3889; 9=10026, 11467
    - O^{17} 8=344
      - doublet splitting 9=568
    - O^{18} 8=6313, 8266; 9=6061
    - O^{19} 7=5553
      - 1.469 MeV level 5=5630
    - Os^{188} excited states 9=8516
    - Os^{189} 9=12023
    - Os^{192} 7=4671
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Nb^{92} 9=3830
Nd^{144} 9=6075
$Nd^{144,150}$ 5=482, 1143
Nd^{147} 9=599
Ne^{19} 5=2071, 3041
$Ne^{19*,23}$ 7=3582, 9332
Ne^{20}, γ-transition lifetimes 6=3944
Ne^{23}, half-life 9=1779
Ne^{24} 6=3949
Ni^{57} 9=8624
Ni^{60}, excited states, upper limit 5=4000
first excited state 5=5612
Ni^{63} 7=3589
Ni^{65} 9=2825
Ni^{66} 6=7676
No 8=317
10-min isotope 8=6236-7
No^{254} 8=6237
Np^{235} 9=598
Np^{236} long-lived isomer, β half-life lower limit 5=2124
O^{14}, decay rate 6=1513
radiative correction 9=7278
O^{15} 7=3582
$O^{15,19}$ 5=2071, 2123
O^{16} 6=1511, 3944, 6832; 8=732, 7304, 9029
γ-transition 5=2110
$Os^{180-3,185}$ 9=2721
$Os^{184,187}$ 5=1143, 9854
$Os^{185,190}$ 8=6228, 8289
$Os^{191,193}$ 9=2731
Os^{193}, by fast β—γ and γ—γ coincidences 9=605
Os^{195} 9=2737
P^{28} 5=7320
P^{29} mirror nucleus 5=2126
$P^{30,32}$ 8=4289, 6232
P^{32} 9=13628
β-disintegration rate by 4π counter 9=11319
$P^{32,34}$ 9=2825
$Pa^{231} \rightarrow Ac^{227}$, 27 keV transition 7=1552
Pa^{231}, $Pa^{234}(UX_2)$ 6=598, 5370
$Pa^{234}(UX_2)$, excited states 7=1542
$Pa^{234,237}$ 5=476, 2108
Pb, in meteorites 9=8
new long-lived isotopes 5=2109
$Pb^{195m,196,197m,198,199,199m,201m,203m,204m}$ 7=647, 4666, 6492
$Pb^{201,203,210,212}$ 5=4888, 7316, 9046
Pb^{202m}, electric quadrupole transitions 9=6068
Pb^{204} 9=6082
Pb^{205} 9=2733
$Pb^{205,209,207m}$, Pb^{212}(ThB) 6=594, 5350, 7645-6, 8352
Pb^{210} 9=10046
Pd isomer 6=3940
$Pd^{98,99,101,106}$ 6=1523, 8942
Pd^{106}, first excited state 5=5612
Pd^{111*} 7=8781
$Pd^{113-115}$ 8=6235
Pm^{147} 7=3588
from fission yield data 5=6477
$Pm^{152,154}$ 9=5067
$Po^{197-204}$ 5=2132
Po^{210}, calorimetric det. 5=1145
half-life 7=3341
$Po^{212}(ThC^{1})$ 8=4288
cine-nucleography det. 5=8186; 6=599

- Radioactivity - contd
  - decay periods - contd
    - Po^{214}(RaC^{1}), 1.416 MeV level 9=12633
    - Po^{214}(RaC^{1}), Po^{217} 6=1507, 3133
    - Pr$^{136-7}$ 9=2723
    - Pr^{137} 5=1146; 9=2722
    - Pr^{141} 6=7616
      - 145 keV level 5=9039
    - Pt^{190} 5=482
    - Pt^{193,200} 7=4662, 8126
    - Pu, fission, delayed neutrons 8=5399
      - heavy isotopes 6=7644
    - Pu^{233,235,237,242} 7=648, 7329
    - Pu^{237m} 8=734
    - Pu^{241} 6=7643
    - Pu^{242}, α and spont. fission 6=6861
    - Pu^{244}, α-decay 6=2341
      - spontaneous fission 6=590
    - Ra 9=6065
      - half-life 7=654
      - precise det. 5=3035
    - Ra^{223} 9=13628
    - Ra^{223,224,226} 8=4275-6, 5299
    - Ra^{224}, first excited state 9=1732
    - Ra^{225,226} 6=3133, 4607
    - Ra^{226} 9=10052
    - Ra^{227} 9=13628
    - Rb 7=1544, 8121
    - Rb^{79,85} 7=6494, 7366
    - Rb^{86,87} 5=3998, 4010, 4889
    - Rb^{87,89} 6=1515. 3935, 8945
    - Re^{177,178,180} 7-4661
    - Re^{180,184,187,190} 5=477, 1143, 9033, 9046, 9854
    - Re$^{180-1,183}$ 9=2721
    - Re^{181,184} 8=5305, 8287
    - Re^{185}, first excited state 5=5612
    - Re^{186} 6=8350
    - Re^{187} 9=1740, 2728, 4994
    - Rh^{98,99,101} 6=8942
    - Rh^{103},excited states 8=1253
    - Rh^{106}, half-life 9=2752
    - Rh^{106m} 5=5609
    - Rn 6=4462; 7=8118
    - Rn(Em)^{221} 6=3133
    - Rn^{222} 5=3999; 7=2576; 9=13628
    - Ru, short-lived isotope 5=9038
    - Ru^{95} 6=7648
    - Ru^{106} 7=3588
    - S^{31,35,38} 8=7334, 8294, 9025
    - S^{35} 9=8529
    - S^{37} 9=2825
    - Sb 7=7326
    - Zb → Te → I chain, precursors of Xe^{132} 7=3593
    - Sb^{117,122} 5=2125, 9858
    - Sb^{119,127} 7=664, 8128
    - Sb^{120,120m} 8=8285
    - Sb^{124} 9=648
    - Sb^{125} 6=5355
    - Sc^{40} 5=7320
    - Sc^{42} 8=5294
    - Sc^{42,49} 6=597, 2351
    - Sc^{46} 7=4664
    - Sc^{48} 9=489
    - Se, neutron-deficient isotope 7=7323
    - Se^{71} 8=4287
    - Se^{73} 7=7366
    - Si^{27} 7=8792; 8=7334
    - Si^{28} 6=3944
    - Sm^{142} 9=12684
    - Sm^{143} 6=3938
    - Sm^{147} 9=1639
    - Sm^{147,152} 8=5282, 6228, 7306
    - Sm^{151}, from fission yield data 5=6477
    - Sm^{153} 9=599
    - Sn, even—even isotopes, excited-level lifetimes 8=6314
      - isomer 9=3830
    - Sn^{113}, γ-decay 6=2368
    - Sn^{127} 6=7647
    - Sn^{130} 5=4863
    - Sr, from U fission 8=3385
    - Sr^{89} 6=7676
    - Sr^{89,90} 5=4001, 6476
    - T 6=596
    - T, terrestrial, snow sample meas. 9=9092
    - Ta^{178,180,181} 8=2541, 5298, 8332
    - Ta^{180} 9=3867
    - Ta^{180,186} 6=1510, 3132
    - Ta$^{181,183-5}$ 5=5600, 6418, 7330
    - Tb, neutron-deficient activities 5=9848
    - Tb^{152} 9=10059, 12640
    - Tb^{155} 9=12657
    - Tb^{160,161} 7=2586, 7324
    - Tb^{161} 6=8345
    - Tc, 2 artific. isotopes, half-lives 7=650
    - Tc^{97} 9=600
    - Tc^{98,105,107,108} 6=604, 2340, 8341
    - Tc^{99} metastable state 5=6421
    - Tc^{99m}, effect of low temp. 9=4993
    - Tc^{103} 9=3866
    - Te^{123} 5=5603
    - Te^{129} 6=2338
    - Te^{132} 7=3593
    - Te^{133m} 8=6277
    - Th, fission, delayed neutrons 8=5399
    - Th^{228} 5=8189; 6=6165
    - Th^{231} 9=2821
      - 186 keV level 9=8531
    - Th^{232} 7=4659, 5584, 9855; 8=3388
    - Th^{233} 7=4659, 5584, 9855
    - Ti^{44,46*,50} 7=5583, 6445, 6447, 9350
    - Ti^{46}, excited states 6=592
    - Ti^{48}, 990 keV level lifetime 8=1226
    - Tl isomers 6=3940
    - Tl^{195,196,197,200,203*,204,208} 7=2578, 3588, 4663, 4666, 5561, 7=6645, 9325
    - Tl^{195,197,203} 6=593, 2346, 7616
    - Tl^{195m,196,197m,208} 8-1235, 1921, 3356
    - Tl$^{198-9, 200-2m}$, electric quadrupole transitions 9=6068
    - Tl^{204} 5=6420; 9=7317
    - Tl^{208}, first excited state 9=1732
    - Tm^{161,163,165,167} 9=3850, 10109
    - Tm^{169} 7=3534
      - 473 keV level half-life 8=6239; 9=602
    - Tm^{172} 6=6106
    - U, fission, delayed neutrons 8=5399
    - U^{232} 5=8190
    - U^{235}, $\alpha-\gamma$ coincidences method 6=612
    - U^{235,238} 7=2618, 3590, 8794, 9822-3
    - U^{238}, disintegration const. 5=4890
      - natural fission 5=3045
    - V^{47,49,50} 5=2128, 2137, 5603
    - V^{48} 9=489
    - V^{48,50} 8=3329, 5298
    - V^{49,50} 7=2571, 9350
    - V^{51}, first excited state 6=4618
    - W isomer 6=3940
    - W^{178} 6=6105
    - W^{180m},from p on Ta 5=8362
    - W^{181}, decay energy 5=5599
    - W^{181,185} 7=4626, 7324
    - W$^{183m, 185m}$ 5=6418
    - Xe^{192m}, half-life of M1 transition 9=3849
    - Xe^{133}, medical radiography appl. 7=1824; 8=6282
    - Xe^{137} 9=7315
    - Xe^{137,138} max. β-energies 5=5610
    - Y, from Y fission 8=3385
    - Y^{88m} 7 1536
      - isomeric state in Zr^{88} decay 5=4016
    - Y^{88m,90} 6=591, 3940
    - Y^{90}, positrons per β-decay 6=3954
    - Y^{90,91} 5=2111, 4899, 5604, 7349
    - Yb, α-decay after p bomb. 8=2543
    - Yb^{167} 9 10109
    - Yb^{169} 7=3534
    - Yb^{169m} 9 10109
    - Yb^{169,175,177} 6=1509
    - Yb^{177} 9=606
    - Zn^{60,61,67} 6=3157, 3942
    - Zn^{65} 7=4664
    - Zn^{67}, isomeric state identification 6=7641
    - Zr^{90} 9=7308
      - excited state 7=8125; 9=617
    - Zr^{96} 6=2355

- Radioactivity - contd
  - decay schemes
    - all radioactive isotopes (Feb. 1958) 8=9027
    - α-decay, review 7=3598
      - spheroidal nuclei 9=612
      - theory 8=3336
    - derivation of activities from counting data 9=4861
    - disintegration schemes of some α-emitters 5=2129
    - electronic isomer simulator, decay statistics 8=9023
    - isotopes of mass 190 6=3936
    - neutron-deficient chains, noble metal region, radiochem. study 5=7350
    - odd-mass nuclei, cascade decay 7=2529
    - 1$^-$ states in even—even nuclei 6=1468
    - polarized neutrons, decay asymmetrics 8=7251
    - rare-earth nucldies, neutron-deficient 9=597
    - resolution of complex decay-curves 7=9841
    - Ac, natural 5=4891
      - natural, β-decay 6=2343
    - Ac^{228} → Th^{228} 8=5273
    - Ag^{104,106} 6=610, 1523
    - Ag^{105} 9=609
    - Ag$^{109*,110,113-117}$ 8=1224, 5302, 6235
    - Ag^{110m} 9=2767, 7331
    - Ag^{111m} 7=4672
    - Al^{24,26} 5=3039, 7320
    - Al^{25} 6=6115
    - Al^{25,26} 8=1225, 1240, 8299
    - Al^{26} 9=2735
      - long-lived ground state 9=6077
      - long-lived isomer 5=9045
    - Al^{29}(β^-)Si^{29} 7=9815
    - Am^{239,242,242m,244} 6=590, 1526, 2352
    - Am^{241} 5=2148, 8223
    - Ar^{35} 9=12664
    - Ar^{35,36,38,41} 7=657, 1547, 3611
    - As^{69,70,71,76} 5=3046, 4015, 5598, 5608, 9857
    - As^{72} 6=4616
    - As^{74} 9=6073
    - As^{76} 8=9037; 9=10076
    - Au^{193} 7=8126
    - Au^{193,195} 5=485, 9046
    - Au^{194,195,197} 6=602, 3048
    - Au^{194,196,198} 8=741, 746
    - Au^{195} 9=7326
    - Au^{200} 9=7313
    - B^{8} 9=601
    - B^{10}, γ—γ correlation 7=2599
    - B^{11} 9=2736
    - B^{12} 5=6436; 9=610
      - β-decay 6=3154
    - Ba^{129}, an investigation 9=6072
    - Ba^{131,133} 5=2147, 4893
    - Ba^{133} 6=5365
    - Ba^{133,140} 8=1937, 3332, 7332
    - Ba^{135m} 9=3847
    - Ba^{141,142} 9=12646
    - Ba^{126}-Cs^{126}, new chain 5=1206
    - Be^{9*,11} 8=6238, 8292
    - Be^{11} 9=10049
    - Bi^{203,204} 9=603-4
    - Bi^{205,207} 7=6437, 8800
    - Bi^{206} 9=11444
    - Bi^{207,214} 5=4002, 6424, 8192
    - Bi^{210}(RaE) 9=13638
    - Bi^{212} 9=607
    - Bi^{212,214} 6=1471, 2354, 2371, 3138, 8=3339, 5326, 6241
    - Bi^{214}(RaC) 5=6427, 9853
    - Bi^{214}—Po^{214}, (RaC—RaC^{1}) total β-energy 7=5585
    - Bk^{245} 6=6109
    - Bk^{246,249} 5=474, 2120
    - Bk^{249,250} 9=12659
    - Br^{82} 6=4608, 8943
    - Br^{84} 8=318
    - C^{9,15} 7=663, 3587
    - C^{12}, α-decay 5=441
      - excited state 6=642
      - 7.65 MeV state 9=4976
    - C^{14}, β-decay theory 6=8357
    - Ca^{38} 8=1234
    - Ca^{39} 5=2123; 9=4995
    - Ca^{40,47} 7=2573, 3611

- Radioactivity - contd
  - decay schemes - contd
    - Ca^{47,48,49} 6=1535, 2351, 2355, 4604
    - Ca^{48}, double β-decay, selection rules 9=10067
    - Cd^{104} 6=610
    - Cd^{106,116}, search for double β-decay 5=8208
    - Cd^{109} 8=5302
    - Cd^{110} 9=7332
    - Cd^{115} isomers 5=3963
    - Cd^{116}, double β-decay, selection rules 9=10067
    - Ce^{137,139,143,144} 6=588, 3142, 6111, 6860, 8944
    - Ce^{137} → La^{137} 9=2723
    - Ce^{139,141} 5=1148, 3973, 4028
    - Ce^{140} 9=10088
    - Ce^{141} 7=9354
    - Ce^{144} 8=1920; 9=10053
    - Cf^{244} 6=5353
    - Cf^{247,248,249,250,252,253} 5=474, 2120
    - Cl^{32,34} 5=2123, 7320
    - Cl^{34,36} 6=2350, 3152, 4617
    - Cl^{34,39} 7=653, 2572
    - Cl^{36} 9=6103
    - Cm^{242}, α decay 9=10058
    - Cm^{245} 5=474
    - Co^{56} 8=6270; 9=11435
    - Co^{56,57,60,62} 5=478, 4869, 4870, 4896, 4900, 9013, 9035
    - Co^{57} 9=8546
    - Co^{57,58,60,61} 6=601, 1521, 3143, 3937, 5352, 6864
    - Co^{58}, electron capture to positron emission ratio 9=12661
    - Co^{60} 9=3870
    - Co^{62} 7=9843
    - Cr^{48,51} 6=608, 3139
    - Cr^{48}—V^{48}—Ti^{48} 5=8188
    - Cr^{51} 7=9844
    - Cr^{51,54} 5=1158. 4019
    - Cs^{132,138} 7=652, 3594
    - Cs^{133} 9=8551
    - Cs^{134} 6=3946; 9=12667
    - Cs^{134,134m,138} 5=3040, 3047, 7317, 9870
    - Cs^{136} 9=10081
    - Cu$^{59-61}$ 6=1517, 1520, 3143, 8269, 9026
    - Cu^{62} 5=478; 9=2760
      - rel. to recent mass measurements 5=4897
    - Cu^{66} 9=608
    - Es^{248,249,250,251,252} 7=2579-80
    - Es$^{253,254,254^m,255}$ 6=3934
    - Er^{169} 9=10048
    - Er^{171} 7=3581; 8=5307
    - Eu^{146} 9=10089
    - Eu$^{151-155}$ 8=319, 1918, 2531, 4286, 5332, 6224, 7302, 7337
    - Eu^{152} 9=7329
      - directional correl. to γ-rays 9=6095
    - Eu$^{152,152^m}$ 7=8127
      - β^+ spectra 9=3861
    - Eu^{152m} 9=1745
    - Eu^{152,154} 5=481; 9=2743, 12666
    - Eu^{155} 6=8943
    - F^{19}, neutron bombarded 5=9928
    - Fe^{52,53} 9=4991
    - Fe^{54,56,57} 8=764
    - Fe^{59} 9=13649
    - Fe^{61} 6=2345
    - Fm^{253} capture—α branching ratio 7=5582
    - Fm^{254,255} 6=3934
    - Fr^{223}, five methods 7=1546
    - Ga^{65} 9=2727
    - Ga^{66,68,70} 8=747, 7309, 8299
    - Ga^{68} 9=4998, 8535
    - Ga^{69,70} 7=3596, 4660
    - Ga^{72} 6=3141
    - Ga^{73} 9=1729, 7321
    - Gd^{146} 9=10089
    - Gd^{147,149,151,153} 8=2532, 5276, 5296
    - Gd^{151,153} 9=635
    - Gd^{153,159} 6=603, 6862, 7649, 8346
    - Gd^{155} 9=8525
    - Gd^{159} 5=9856; 7=1539; 9=1720, 2734
    - Gd^{161} 9=12644
    - Ge^{65} 9=4984
    - Gd^{67} 9=8528
    - Ge^{68} 6=6110; 9=4998
    - Ge^{75,75m,77,77m} 5=2119, 9001

- Radioactivity - contd
  - decay schemes - contd
    - Ge^{77,77m} γ- and β- decays 8=2538
    - He^{6} 5=2123; 9=12664
    - Hf^{175} 6=1508, 1528
    - Hf^{175,177} 5=2074, 9034
    - Hf^{181}—Ta^{181} 6=6884; 7=6497; 9=7318
    - Hg^{193,194,195,197} 6=602, 3945, 6884
    - Hg^{193,195} 9=7319
    - Hg^{195} → Au^{195} 5=3050
    - Hg^{200} 9=2755
    - Hg^{203} 5=4894
    - Ho^{160} 9=10062
    - Ho^{160,166} 8=1233, 5334
    - Ho^{164,167} 5=1149, 6417
    - Ho^{166} 9=599
    - I$^{123-4}$ 9=4999
    - I^{126} 5=7319
    - I^{127} 9=7315
    - I^{128,131} 6=1514, 1516, 1545, 3165
    - I^{130} → Xe^{130} 9=10051
    - I^{134} 9=11440
    - In^{107,114,114m} 6=1525, 2348, 4606
    - In^{113m} 9=12647
    - In^{114} 9=3862
    - In^{117} 5=2125
    - In^{120m} 8=8285
    - Ir^{190}, 11d 9=8533
    - Ir^{190,192} 6=1519, 1524, 3936
    - Ir^{191,192,192m,194} 5=480, 2122, 4901, 9046
    - Ir^{191m} 9=1731
    - Ir^{192} 9=12666
    - Ir^{192m} 9=13621
    - K, natural, branching ratio 6=3136
    - K^{38,40} 6=2339, 2350
    - K^{38,40,42} 5=1154, 2123, 4033
    - K^{39,43} 7=5621, 6519
    - K^{42} 9=11428
    - K^{43} 9=12643
    - Kr^{76,77,79,85m,85,87,88} 5=3047-8
    - Kr^{85m}, branching ratio 6=600
    - La^{135} 9=3847
    - La^{136} 9=10081
    - La^{137,138,140} 6=605, 6129, 8347, 8944
    - La^{138} 7=4669
    - La^{140} 9=10088
    - La^{141,142} 9=12646
    - Li^{7*} 7=2581
    - Li^{8} 5=2123, 6436 9=611
    - Lu^{176} 5=9854
    - Mg^{25,25*} 7=6436, 7380
    - Mg^{27} 6=3146
    - Mn^{52} 9=3857
    - Mn^{52,55} 6=5394, 6876
    - Mn^{52,56} 8=5308, 8269
    - Mn^{53} 5=9044
    - Mn^{56} 9=11435
    - Mo^{91} 7=2582; 8=740
    - Mo^{91,91m,99} 5=3053, 4013
    - Mo^{92,100}, search for double β-decay 5=8208
    - Mo^{99} 9=2738
    - N^{13,16} 8=5316, 8298
    - N^{14} 9=7342
    - N^{14,16,17} 7=5556, 7393
    - N^{16}, β-decay 6=2312; 9=1736
    - Na^{22,23,25} 5=1179, 2141, 7331
    - N^{22,24}, β-spectra 9=1735
    - Nb^{90} 5=3051; 8=3330
    - Nb^{92} 9=6074
    - Nb^{97} 7=6496
    - Nd^{140,141} 8=5304, 7336
    - Nd^{147} 5=3973, 4018;9=599, 1734, 3847
    - Nd^{150}, energy available for β-decay 5=8209
    - Nd^{151} 9=12645
    - Ne^{20,23} 7=3582, 5555
    - Ne^{23} 9=12664
    - Ne^{24} 6=3949
    - Ni^{57} 7=8797; 8=3334; 9=3857
    - Ni^{66} 6=4600
    - Np^{235,236,239} 6=2363, 3171, 5354
    - Np^{238}, β-decay 5=8201-2
    - Np^{241} 9=4990

- Radioactivity - contd
  - decay schemes - contd
    - O^{15} 5=2123
    - O^{16} 7=5554
      - dipole selection rule 6=1511
    - Os^{185} 7=9358; 8=8289
    - Os$^{189m, 190m}$ 9=2766
    - Os^{190} 9=12625
      - isomers 6=3936
    - Os^{191,193} 9=2731
    - Os^{193}, by fast β—γ and γ—γ coincidences 9=605
    - P^{28} 5=7320
    - P^{29}, mirror nucleus 5=2126
      - positron polarization 8=8299
    - P^{30} 6=2350
    - P^{30,34}, β-decays 7=653
    - P^{31} 9=3831-3
    - P^{32} 9=3862
      - β-spectrum 9=1735
    - Pa, β-decay 6=616
    - Pa^{228} 7=1545
    - Pa^{233,234,237} 5=476, 1147, 9862
    - Pb neutron-deficient isotopes 5=4007
    - Pb^{195m,196,197m,198,199,199m,203,204m} 7=4666, 6492, 9370
    - Pb^{198} 9=8544
    - Pb^{201,203,204m} 5=479, 9046
    - Pb^{202m,212}, Pb^{210}(RaD) 8=2544, 3317, 5295, 5303
    - Pb^{204,206,207}, shell and collective theory 6=3144
    - Pb^{210}(RaD) 5=8224, 9036; 7=655, 2593; 9=3882
    - Pd^{98,99,101} 6=8942
    - Pd^{103} 5=2999, 8187
    - Pd^{105m,109m} 9=6099
    - Pd$^{109,113-115}$ 8=5302, 6235
    - Pm^{143,144} 9=6075
    - Pm^{145} 9=4996
    - Pm^{148} 9=12642
    - Pm^{150,151} 5=2118, 4018
    - Po^{206,211}, Po^{212}(ThC^{1}), Po^{214}(RaC^{1}) 8=2529-30, 3336, 5278, [9030
    - Po^{207} 9=6063
    - Po^{210}, branching ratio 7=1550
      - Migdal's theory verification 5=472
    - Po^{211,214} 5=2113, 2131
    - Po^{212}(ThC^{1}) 5=4003
    - Pr^{137} → Ce^{137} 9 =2723
    - Pr^{140,144} 8=1920, 7336
    - Pr^{142}, β—γ branching ratio 9=13633
    - Pr^{144} 7=2583
      - axial vector interaction 9=1733
      - → Nd^{144} 9=10068
    - Pr^{192,199} 7=3595, 8795
    - Pt^{199m} 9=12635
    - Pu^{235,237,240} 7=3599, 7329
    - Pu^{239}, α-decay 8=1923
      - β-decay 5=8203
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